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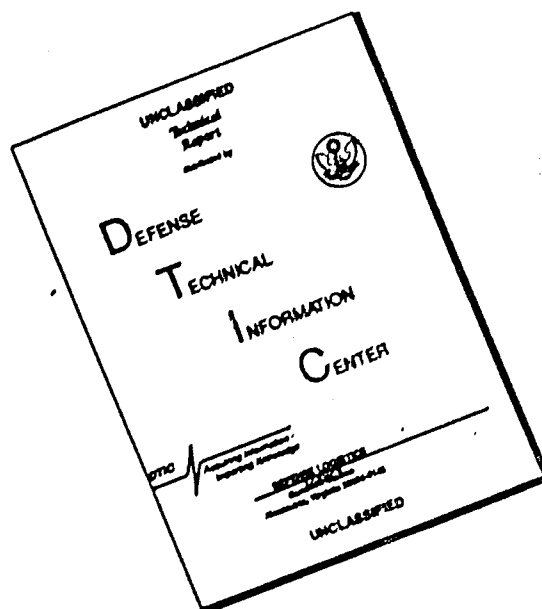


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TCREC TECHNICAL REPORT 62-42

**MEASUREMENT OF DYNAMIC AIR LOADS  
ON A FULL-SCALE SEMIRIGID ROTOR**

Task 9R38-01-019-04

Contract DA 44-177-TC-653

December 1962

**prepared by:**

BELL HELICOPTER COMPANY  
Fort Worth, Texas





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U. S. ARMY TRANSPORTATION RESEARCH COMMAND  
Fort Eustis, Virginia

This report has been reviewed by the U. S. Army Transportation Research Command and is considered to be technically sound. The report is published for the exchange of information and stimulation of ideas.

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Task 9R38-01-019-04

Contract DA 44-177-TC-653

December, 1962

MEASUREMENT OF DYNAMIC AIR LOADS ON A FULL-SCALE  
SEMIRIGID ROTOR

USATRECOM Report No. TCRC TR 62-42

Bell Helicopter Company Report No. 525-099-001

Prepared by



**BELL  
HELICOPTER COMPANY**

POST OFFICE BOX 482 • FORT WORTH 1, TEXAS

A DIVISION OF BELL AEROSPACE CORPORATION

A **Textron** COMPANY

for

U. S. ARMY TRANSPORTATION RESEARCH COMMAND

Fort Eustis, Virginia

## FOREWORD

This report describes the HU-1A dynamic air load measurement program and presents reduced data for selected flight conditions. The program was conducted by Bell Helicopter Company under U. S. Army Transportation Research Command Contract DA 44-177-TC-653 (Reference 1), and was carried out under the technical cognizance of Mr. John Yeates, USATRECOM, Fort Eustis, Virginia.

The program began in July, 1960 and was completed in June, 1962. Personnel associated with the program include Mr. F. B. Burpo, the Research Project Engineer, and Messrs. R. T. Bybee, B. Blankenship, J. A. DeTore, G. Boswell, and R. R. Lynn of Bell Helicopter Company. Additionally, Mr. E. L. Davis, a special consultant to USATRECOM, contributed many valuable suggestions during the early part of the program.

It was beyond the scope of the program to check every one of the thousands of data points presented. As discrepancies are found, it is requested that they be reported to Mr. J. Yeates of USATRECOM.

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## LIST OF SYMBOLS

GW	Gross weight
$H_D$	Pressure density
$H_P$	Pressure altitude
I.A.S.	Indicated airspeed
K	1000 (used to denote electrical resistance)
$N_1$	Engine shaft r.p.m.
$N_2$	Engine gas producer r.p.m. in per cent
O.A.T.	Outside air temperature
P	Pressure
R	Radius
SHP	Shaft horsepower
$V_{max}$	Velocity, maximum
Z/D	Ratio of rotor diameter/rotor height above ground
$\Delta P$	Differential pressure
$\sigma$	Density ratio
$\psi$	Main rotor azimuth angle in degrees; zero degrees is for instrumented blade over tail boom

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## I. SUMMARY

This report describes a program to measure the dynamic air loads acting on the HU-1A semirigid main rotor and presents reduced data for selected flight conditions. The work reported includes only that pertaining to the data gathering, reduction, and presentation. The analyses and interpretation of those data are outside the scope of the program as defined in Reference 1.

Descriptions of the basic HU-1A helicopter, the instrumentation system, and various component tests are given. The latter include blade fatigue, differential pressure transducer, slip ring qualification, and main rotor vibration tests. All components performed satisfactorily.

The flight program is described. A total of three data flights were made during which 68 steady state and maneuver flight conditions were recorded. The flight conditions and related information are tabulated.

The data recording, processing, and presentation are discussed. Calibrations, sign conventions, and reduced data for eleven steady state and two maneuver conditions are given. The reduced data include:

- IBM tabulations of blade differential pressures, air loads, bending moments, controls and blade positions, center of gravity accelerations, controls loads, and various harmonic analyses;

- Curves of differential pressures versus chord, air loads versus span and azimuth, thrust versus azimuth, and blade bending moments versus span and azimuth;

- Tables of related photo panel (velocity, temperature, etc.), and helicopter attitude and position information.



## II. INTRODUCTION

The design of modern rotor systems has been hampered due to the lack of knowledge of the basic air loads acting on the blades. These fluctuating air loads are responsible for the rotor and control system fatigue loads and the cockpit vibrations associated with helicopter operation. The various harmonics of the air loads act on the blade, which responds as a function of its dynamic characteristics. Due to the complex interrelation of the aerodynamic forces acting on a blade and the dynamic characteristics of that blade, the experimental determination of the actual air loads acting on a rotor is impossible without direct pressure measurement.

Recognizing this, the U. S. Army Transportation Research Command (USATRECOM) initiated a broad experimental program to define the inflight air loads acting on rotor blades. The first such project involved National Aeronautics and Space Administration (NASA) tests with the articulated four-bladed rotor H-34 helicopter. That work is reported in part by Reference 2. The second part of the over-all air loads program involved the subject Bell Helicopter Company tests of the semirigid two-bladed rotor system of the HU-1A helicopter. The purpose of the Bell work, as defined by Reference 1, was to gather, reduce, and present selected data from the test flights. The analysis and interpretation of those data were outside the scope of the program.

These two projects are the first known programs to measure air loads on a full scale rotor in flight. However, similar wind tunnel model tests were conducted in 1956 by NACA. These model tests are reported by Reference 3. It is hoped that the analysis and application of the data presented herein will allow greatly improved rotors for future helicopter designs.

At the onset of the program, it was planned that the basic air load and moment data would be reduced by use of a 12-point harmonic analysis. Oscillograph trace sensitivities, channels per oscillograph, paper speed, etc., were adjusted accordingly. The major portion of the data, flight conditions, etc., presented herein follows this initial planning and is referred to as Type I data, conditions, etc.

During the course of the program, USATRECOM advised the contractor that a new rotor air load prediction technique was being developed by the Cornell Aeronautical Laboratory and that it was desirable to use data from the subject program for correlation purposes. During subsequent discussions with personnel from USATRECOM and the Cornell Aeronautical Laboratory, it was decided that the HU-1A data to be supplied to the Cornell Aeronautical Laboratory should have a greater sensitivity than that originally planned; further, that a 24-point instead of a 12-point harmonic analysis should be used. To accomplish this, it was necessary to increase the sensitivity of the air load oscillograph traces, to delete some oscillograph traces (to allow for increased sensitivity), and

to increase the oscillograph paper speed. The resulting four flight conditions and data are referenced to herein as Type II flights, conditions, data, etc. The results of the Cornell Aeronautical Laboratory air load prediction work are reported in Reference 4.

### III. DESCRIPTION OF TEST EQUIPMENT

#### A. HELICOPTER

The helicopter used during the subject program was the United States Army HU-1A Iroquois, Serial Number 59-1616. An in-flight photograph of the test helicopter is shown in Figure 1. A three-view drawing of the basic HU-1A is shown in Figure 2; pertinent data for the test machine are listed below.

Take-off Gross Weight (pounds)	6175
Center of Gravity (inches, reference Sta. 0, Fig. 2)	133.1
Engine	Lycoming T53-L-1A (Serial No. LE 00239)
Power/Engine Speed (Horsepower/r.p.m.)	770/6400
Out of Ground Effect Ceiling (feet)	12,000
Cruise Speed (knots)	100

#### Main Rotor Data

Number of Blades	2
Diameter (feet)	43.75
Chord (inches)	15.2
Blade Twist (degrees)(from centerline of rotation to tip)	-12
Blade Section	NACA 0015
Tip Speed (feet/second)	
At engine speed of 5800	652
At engine speed of 6400	720
At engine speed of 6600	742
Ratio of Blade Pitch to Bar Flapping	.16
Pitch Link Arm to Blade Feathering Axis (inches)	7.0

#### Rigging Data

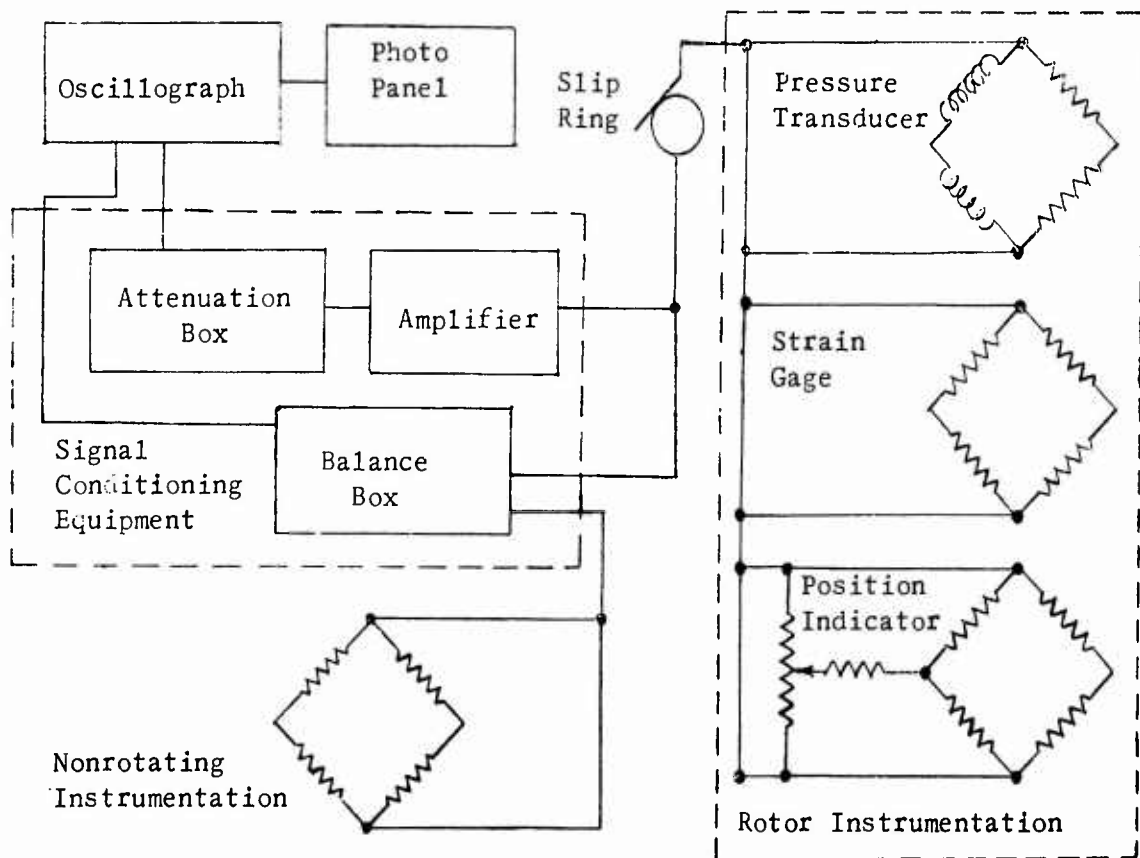
Fuselage	
Fore and aft (degrees)	0
Lateral (degrees)	0
Mast	
Forward (degrees)	3
Lateral (degrees)	0
Swashplate (neutral cyclic control)	
Forward (degrees)	3
Left (degrees)	-1 (left side down)
Swashplate	
Cyclic control full forward (degrees)	14.5
Cyclic control full aft (degrees)	-9
Cyclic control left (degrees)	-9.25
Cyclic control right (degrees)	9.5
Blade Angle at Blade Station 23	
Collective control full down (degrees)	9.5
Collective control full up (degrees)	22.5

## B. INSTRUMENTATION SYSTEM

### 1. General (Block Diagram)

The data presented during the subject program were recorded manually, by oscillograph, and by photo panel. Counter number, maneuver description, and pilots' comments were recorded manually; airspeed, altitude, outside temperature, rotor speed, and power were recorded by photo panel; and the outputs of the rotor and/or fuselage mounted pressure, strain, and position transducers were recorded by oscillograph. Photo panel correlation traces were also recorded on the oscillograph.

A block diagram of the basic instrumentation system developed and used during the subject program is shown in the accompanying sketch. Figure 3 shows the instrumentation installation in the cabin of the HU-1A helicopter. Discussions of the major components peculiar to this system are given in the paragraphs below. Table 1 gives a complete list of all the oscillograph data channels recorded. Reference 5 is a complete wiring diagram of the instrumentation system.



BLOCK DIAGRAM OF INSTRUMENTATION

## 2. Components

a. Pressure Transducers - NACA-developed miniature pressure transducers were used during this program to measure the differential pressure between the upper and lower surface of one main rotor blade. The basic transducer is described in NACA Technical Note 2659 (Reference 6); a photograph of one of the transducers used during the program is shown by Figure 4.

The device operates on a variable air-gap inductance principle. A thin stretched diaphragm is mounted between two coils; one side of the diaphragm is connected to the upper blade surface, the other side to the lower surface. Differential blade pressure results in a deflection of the diaphragm and a consequent air gap and inductance change which is amplified and recorded. The transducer output was amplified by Consolidated Electrodynamics Corporation (CEC) System D amplifiers which supply a 3000 cycle excitation voltage.

The transducers used during this program were supplied by the Modern Machine and Tool Company, Inc., Newport News, Virginia. All units were carefully inspected as described in a later section and performed satisfactorily during the program.

b. Main Rotor Slip Ring - Figure 5 shows the slip ring assembly which was developed and used during this program. The slip ring assembly is defined fully in Reference 7. The Bell-designed unit which was built by the Instrument Engineering Company of Austin, Texas, successfully completed its qualification tests (Reference 8) and performed satisfactorily during the program.

The slip ring is constructed in four sections, three 50-ring segments with two brushes per ring, and a 14-ring segment with four brushes per ring. The 14 rings were power carriers; the remaining 150 rings were used to carry signals.

The slip ring assembly was installed inside the main rotor mast with only the rotating plug connector protruding from the top (see Figure 6). It was driven by a cap fitting over the top of the mast and held stationary by a stand pipe extending out the bottom of the mast and attaching to the frame of the ship. The stationary wiring was brought down through the pipe to the signal conditioning equipment.

c. Attenuation Box - The attenuation box was used for two reasons; first, it was used to attenuate or adjust the signal amplitude, and second, it was used to provide a matching network.

Type 7-312 and 7-315 galvanometers were used during the program with the CEC System D amplifiers. The output impedance of this type of amplifier was not the correct value for the above galvanometers. The contractor was informed by NASA personnel early during the program that the high frequency galvanometers that are intended to be used with that amplifier (323 galvanometers) produced "hashy" oscillograph traces when used

with the NACA transducers. Therefore, the lower frequency galvanometers were used and a matching network was required.

A potentiometer was used in the matching network. The amplifiers have step attenuators which allow the signal amplitude to be varied in large increments; however, a finer amplitude adjustment was required for the subject program. Therefore, an adjustment potentiometer was incorporated in the attenuation box.

d. Photo Panel - The following instruments were installed in the photo panel.

- Airspeed indicator (knots)
- Altimeter (feet)
- Tachometer, engine ( $N_1$ ) and rotor (r.p.m.)
- Tachometer, gas producer ( $N_2$ ) (per cent r.p.m.)
- Temperature gage, outside air (degrees centigrade)
- Pressure gage, high torque, engine (p.s.i.)
- Pressure gage, low torque, engine (p.s.i.)

The instrument readings were recorded by a Model G Automax 35 mm camera.

e. Standard Items - The following equipment was installed in the helicopter for the test program.

Six Consolidated Electrodynamic Corporation (CEC) oscillographs, Model 5-114-P3-18.

Three CEC Model 2-105B power supplies with 1-113B amplifiers.  
Two CEC Model 2-105 power supplies with 1-113B amplifiers.

Attitude gyro: Lear K4B System.

Rate gyro: Minneapolis Honeywell Model VFDD-1 with K-3 gyros.

Accelerometers: Statham Model A17-3-120

Position Indicators: A potentiometer was used to unbalance a Wheatstone Bridge.

Angle of attack and yaw vane - Aerodynamic vanes were connected to potentiometers. The vanes were mounted on a boom as shown in Figure 1. The boom vane position was at the following approximate location: Water Line +40; Butt Line 0; Station -100.

### C. INSTRUMENTED BLADES

The most important item of the program (and the most difficult to assemble) was the fully instrumented main rotor blade. A schematic of that blade (designated as the red blade) is shown in Figure 7. This blade is

detailed completely by Reference 9. It was instrumented to measure beam and chord bending, torsion, and differential pressure.

For the purpose of tracing bending moments across the hub and establishing mode shapes, chord and beam bending gages were installed on the second, or white blade. Also, the mass distribution for the two blades was assured by installing dummy transducer trays in the white blade.

The following paragraphs describe the strain and pressure sensor installations and present basic dynamics data for the red blade.

### 1. Strain Gage Installation

Baldwin-Lima-Hamilton, SR4 paper strain gages, type A-13, were installed on the blades per standard Bell Helicopter Company laboratory procedure. A thin coating of epoxy fairing putty was applied over all strain gages and lead wires and was sanded so that the installation was aerodynamically clean. Figure 8 shows a photograph of the completed installation.

The locations of the strain gages in per cent radius are:

#### Red Blade

Beam Bending: 15; 28; 36; 45; 60; 65; 80; 92.5  
Chord Bending: 15; 28; 60; 80  
Torsion: 15; 50

#### White Blade

Beam and Chord Bending: 15; 28

### 2. Pressure Sensor Installation

Forty-four pressure transducers of the type shown by Figure 4 were installed in the red blade. The transducer installation consisted of the following components:

Tray Assemblies - These assemblies included transducers, bridge resistors, and mounting hardware (see Figure 9). Stainless steel tubing (.0625 inch, .010 wall) was used to connect the pressure transducer to the tray air pressure orifices. All tubing lengths were quite short and the maximum length used was 3.5 inches.

Aluminum Tubes - These tubes served as an electrical conduit to carry the transducer lead wires and also to position the trays spanwise inside the blade.

The trays were shaped to match the inside contour of the three blade sections (i.e., box beam, mid-, and trailing-edge sections). Figure 10 shows the three tray assemblies used.

Six tray assemblies of each shape were mounted to three aluminum tubes and each tube was then inserted into the matching blade section from the tip. Figure 11 shows the tube and tray assembly for the box beam section partially installed in the blade. Foam spacers supported the tube between the transducer stations.

After all assemblies were in place, the trays were connected to the blade by screws with drilled orifices. Prior to the final installation, the heads of the orifice screws were filed to be flush with the blade surface.

The span and chordwise locations of the pressure transducers installed in the red blade are:

<u>Spanwise Station</u> <u>Per Cent Radius</u>	<u>Chordwise Station</u> <u>Per Cent Chord</u>
40	4; 17; 34; 63; 88
55; 75; 90; 95	2; 9; 17; 23; 34; 63; 90
85	2; 4; 9; 13; 17; 23; 34; 47.7; 63; 77; 90

The installation performed satisfactorily. During the course of the program, however, two transducers became inoperative (at 85 per cent radius, 47.7 per cent chord and at 95 per cent radius, 34 per cent chord).

### 3. Mass and Stiffness Distribution

Chordwise stiffness, beamwise stiffness, and weight distribution curves for the special blades of this program are shown in Figures 12, 13 and 14, respectively. A comparison with the standard HU-1A blade is given in Figure 14.

The transducer installation had small or negligible effect on the stiffnesses. From Figure 14 note that 30 per cent of the total weight added to the standard blades is concentrated at the six transducer stations.

The chordwise center of gravity shift of the blade was determined to be approximately 0.3 per cent of the chord. This is considered to be negligible.



#### IV. MISCELLANEOUS ANALYSES AND COMPONENT TESTS

During the course of this program, various analyses and component tests were conducted to establish the approach and to verify equipment performance and structure. The results of these analyses and tests are summarized below.

##### A. TRANSDUCER PRESSURE RANGE DETERMINATION

A study was conducted to define the maximum differential pressure which might be expected at the various locations over the blade for the flight conditions required by this program. The results of these calculations allowed the selection of the proper range pressure transducer to be installed at each blade location.

For a helicopter gross weight of 5900 pounds, a rotor speed of 314 r.p.m., and an ICAO standard day at sea level, differential pressures over the blade as a function of azimuth positions were calculated for the following flight conditions: (1) hover out of ground effect; (2) 120 knot straight and level flight; (3) 50 knot, 2140 foot per minute climb; (4) 80 knot entry, 1.39 g pull-up, and 770 shaft horsepower. Calculations were based on the experimental pressure data of NACA Report 832 (Reference 10). The highest pressures for all spanwise stations inboard of 95 per cent radius were predicted for Condition No. 4 above, and the highest pressures at the 95 per cent radius were predicted for Condition No. 3. The contractor's IBM 650 computer Program C21 was used to obtain values of angle of attack and Mach number for these flight conditions.

In the chart below, the calculated values of maximum differential pressures are shown in parentheses. The values to the right of the ones in parentheses are the maximum pressure ranges of the transducers used. The results of the flight tests showed that these values were adequate for the test program.

		MAXIMUM DIFFERENTIAL PRESSURE					
		$\Delta P$ , p.s.i.					
Span Sta. Ch. in % R Sta. in % Ch.		40	55	75	85	90	95
2			(8.9) 15	(11.8) 15	(11.3) 15	(12.0) 15	(12.0) 15
4	(5.2) 8				(10.6) 15		
9			(5.8) 15	(9.0) 15	(9.5) 15	(8.9) 15	(9.4) 15
13					(8.6) 15		
17	(3.2) 8	(3.7) 8	(5.4) 8	(7.3) 15	(7.2) 15	(7.5) 15	
23		(2.8) 8	(4.3) 8	(5.8) 15	(5.8) 15	(6.8) 15	
34	(1.4) 8	(2.0) 4	(2.5) 8	(2.8) 8	(3.7) 8	(3.4) 8	
47.7				(1.4) 4			
63	(0.5) 1	(0.8) 2	(0.9) 2	(1.1) 2	(1.3) 4	(1.3) 4	
77				(0.8) 2			
88	(0.1) 1						
90		(0.3) 1	(0.5) 1	(0.61) 2	(0.8) 2	(0.8) 2	

## B. BLADE STATIC STRESS ANALYSIS

A static stress analysis of the critical blade station for various flight conditions was made. This analysis showed that the most critical spanwise station for the modified blades is the same as that for the standard blade. The critical spanwise station occurs at the 13 per cent radius and is well inboard of the modified sections of the blade.

## C. BLADE FATIGUE TESTS AND SAFE LIFE DETERMINATION

As described previously, holes were drilled through the rotor blade nose block, box beam, and skin to mount the transducer installation. These holes produced stress raisers which reduced the fatigue strength of the basic blade. Therefore, it was necessary to determine a safe life for the instrumented blades of the subject program. The determination of a safe life involved blade specimen fatigue tests (Reference 11) and analyses of the fatigue test data (Reference 12). The following paragraphs summarize this phase of the program.

Four HU-1A main rotor blade specimens were tested with the transducer trays installed. Testing was accomplished in a constant displacement fatigue test machine as shown by Figure 15. This machine applied combined mean and oscillatory chord and beam bending moments in addition to a steady axial load to simulate centrifugal force. The bending moments, expressed as a per cent of the YH-40  $V_{max}$  loads measured during the YH-40 flight "load" survey, were: 111 per cent for blade specimen Serial No. A2-2, 110 per cent for specimen Serial No. A2-16, 79 per cent for specimen Serial No. A2-15, and 70 per cent for specimen Serial No. A2-18. Cycles to failure were plotted as a function of stress level at the critical chordwise location (17 per cent) and a mean curve through the test data was drawn. Subsequently, the failure stress levels at all frequencies were reduced 20 per cent to account for scatter. Based on these data and an assumed conservative flight spectrum for the test helicopter, fatigue life calculations were made for several configurations of the test blade.

The calculations indicated that with the most inboard instrumented blade station at the 30 per cent radius, the blade life would be about 70 hours. With the most inboard instrumented blade station at the 40 per cent radius, the life of the blade was calculated to be 140 hours. Because of the large increase in blade life, the blades were constructed with the most inboard instrumented station at the 40 per cent radius.

During the flight test program, a review of the measured data revealed that the blade moments at the 75 per cent radius were higher than had previously been measured during the YH-40 tests and that there was a significant amount of five per revolution beam bending during certain flight conditions. Additional fatigue life calculations were made and the 75 per cent radial station was found to be critical. At this time it was estimated that 15 hours flight time would be adequate for the subject program.

Since 15 hours was well under the new fatigue life of the blades, it was decided that this flight time would not be exceeded without additional analysis and a careful inspection of the blade. These were not required.

#### D. SLIP RING QUALIFICATION TESTS

Qualification tests of the main rotor slip ring assembly were conducted by the Southwest Research Institute, San Antonio, Texas, and are reported in Reference 8. The slip ring assembly was operated at approximately 340 r.p.m. to determine the mechanical and electrical performance under adverse environmental conditions of low and high temperatures ( $0^{\circ}$  to  $120^{\circ}\text{F}$ ), relative humidity (100 per cent), and high altitude (15,000 feet).

Each test consisted of one-hour runs during which the slip ring assembly was operated in the clockwise and counterclockwise directions for each of the four test conditions. Temperature and self-generated noise were checked during the tests.

After completion of the eight hours of operation the slip ring assembly was checked for resistance, dielectric strength, and brush wear. The resistance to ground was over 500 megohms and the insulation withstood 500 volts AC, 60 c.p.s., for five seconds. Brush wear or "dusting" was slight and over-all performance was excellent.

#### E. LABORATORY CENTRIFUGE TEST

After completion of the preliminary design of the transducer tray and installation, it was decided to conduct a centrifuge test on a typical assembly. The purpose of this preliminary test was to check the structural strength of the assembly during high acceleration forces and to establish that the transducer as mounted did not produce extraneous outputs due to case distortion. The test was accomplished early in the program (October, 1960) before the final blade design was completed. Figure 16 shows a photograph of the test fixture and a mockup of the box beam transducer tray assembly. The rotating arm shown was a section of a box beam used in the HU-1A main rotor blade, and the transducer tray assembly was installed in the tip. The transducers were connected through a slip ring to amplifiers which were connected to a recording oscillograph.

The beam was rotated at 1500 r.p.m. which produced a 762 g acceleration on the transducer installation (corresponds to 95 per cent radius on an HU-1A rotor). With the orifices sealed, no output was recorded and it was therefore established that centrifugal force would cause no extraneous signal.

Accelerating the device to 1500 r.p.m. required approximately one second. The assembly was started and stopped 100 times for the purpose of straining the tubing connections and the mounting with repeated inertia loads. Inspections of the installation after completion of the tests showed all connections and hardware to be satisfactory and it was concluded that the installation was adequate.

#### F. GROUND RUN AND FLIGHT TEST OF TYPICAL TRANSDUCER INSTALLATION

During February, 1961, a ground run and a short flight test were conducted with a blade which had a complete transducer installation at the 95 percent radius. These tests were conducted to prove the structural adequacy of the transducer installation and to evaluate the overall system in flight. Also, any instrumentation "noise" or "hash" problems which might occur during later tests could be determined and corrected.

Three tray assemblies, including seven transducers, were installed at the 95 percent radius station of one HU-1A main rotor blade. This installation at 95 percent radius was similar to that used later in the fully instrumented blade. The main rotor slip ring assembly discussed earlier was also installed on the helicopter so that its performance could be checked.

The results of this test showed that,

- 1) the installation was structurally adequate,
- 2) the recording system functioned properly,
- 3) the air pressures recorded were within the range of the transducers, and
- 4) the slip ring assembly was satisfactory.

In addition, four air pressure leaks were discovered. Two of the leaks were caused by the assembly procedure, and two were the result of faulty transducers. Changes were made in the assembly and transducer testing procedures to eliminate, insofar as possible, a similar occurrence in the final installation.

#### G. MAIN ROTOR BLADE SHAKE TESTS

A shake test was conducted to determine the natural frequencies of the instrumented main rotor blades. The rotor was suspended by means of elastic cord fastened to the centerline of the trunnion. The pitch of the blades was adjusted so that the chord line at 75 percent radius was horizontal. MBelectronic shaker equipment was used for the tests. This shaker allows the operator to control the force and frequency of the input motion.

To determine the beamwise symmetrical bending modes, an MB shaker was attached so that the force was applied vertically at the centerline of the hub (directly under the suspension point). For determining the asymmetrical beamwise modes, the shaker was offset in the spanwise direction approximately ten inches.

The symmetrical chordwise bending modes were determined by connecting the shaker to the centerline of the hub with the force applied horizontally. Asymmetrical chordwise modes were investigated by offsetting the shaker approximately ten inches in the spanwise direction.

The results of these tests are given below. Also shown for comparison are the similarly determined natural frequencies of the standard HU-1A rotor. All modes compare closely except the first chord asymmetric bending.

#### BLADE STATIC NATURAL FREQUENCIES

MODE	Frequency in Cycles Per Second	
	Standard Blade	Instrumented Blade
<u>Beamwise</u>		
First Symmetric	2.08	2.20
Second Symmetric	9.00	8.75
Third Symmetric	22.3	22.75
First Asymmetric	5.5	4.5
Second Asymmetric	15.8	13.8
<u>Chordwise</u>		
First Symmetric	7.5	7.5
First Asymmetric	20.7	27.0

#### H. GALVANOMETER PHASE SHIFT TEST

A large phase shift between the origination of a signal and the recording of a signal, or between two instrumentation channels, would cause large errors in the data. To measure the phase shift of an air pressure signal from the rotor blade through the instrumentation system, including the amplifiers, would be extremely difficult. However, the major cause of any phase shift was expected to be the CEC galvanometers in the oscillographs. The phase shift produced by these galvanometers was investigated.

The basic frequency reference on the oscillograph records was the azimuth indication (24 "blips" per revolution). Therefore, it was important to compare all signal galvanometers with the azimuth galvanometer.

The following CEC galvanometers were used during the test program:

Galvanometer Type	7-323	- azimuth indication (natural frequency of 1000 c.p.s.)
"	"	7-325 - accelerometers (natural frequency of 18.5 c.p.s.)
"	"	7-339 - attitude gyros (natural frequency of 50 c.p.s.)
"	"	7-312 - all other channels and 7-315 (natural frequency of 100 c.p.s.)

A Type 7-317 galvanometer with a natural frequency of 3700 c.p.s. was used during the phase shift test as a reference. Galvanometers Types 317, 323 and 312 were installed in an oscillograph; a signal of constant amplitude was applied and the frequency was varied from 0 to 60 c.p.s.

The results of the test program proved that the galvanometer phase shift was as expected; that is, the phase shift varied as any damped spring-mass system. CEC galvanometers normally employ .64 critical damping. This value yields a flat frequency response ( $\pm 2$  per cent) to at least 60 per cent of the natural frequency, and approximately a linear variation of phase angle with frequency. Therefore, at 30 c.p.s. (approximately six per revolution) the phase shift is  $30/100 \times 90$  or 27 degrees for the 312 and 315 galvanometers. This is only 27/6 or about 4.5 degrees when referred to the one-per-revolution rotor frequency.

# I. TEST OF NACA PRESSURE TRANSDUCER

NACA Model 49 pressure transducers were thoroughly tested as a part of their receiving inspection at Bell. The manufacturer of these transducers was not equipped to test the devices as thoroughly as needed, consequently the Bell tests were quite stringent. The results of all tests discussed below were examined to select the most accurate transducers from the group received.

## 1. Temperature

Variations of the transducers' outputs due to temperature were investigated. These changes were manifested as a shift in the zero reference or a change of sensitivity, or both. To investigate these items the transducers were subjected to temperature variations of 0 degrees Fahrenheit to 120 degrees Fahrenheit. The environmental temperatures in which the transducers would be operated were within this range. The fixture which was used to mount the transducer for the tests is shown in Figure 17. Transducer outputs were recorded on a CEC oscillograph through CEC System D amplifiers. The transducers were placed in an environment of 0 degrees Fahrenheit, and 15 minutes were allowed for the transducers' temperatures to stabilize. They were balanced and the output due to applying full range pressure was recorded. The transducer balance was checked and the temperature was increased from 0 to 120 degrees Fahrenheit. Zero shift was recorded. Next, full range pressure was applied and the output recorded.

The zero shift and sensitivity changes were then expressed as a percentage of the full range output per degree Fahrenheit as shown below:

$$\text{Percentage Zero Shift} = \frac{(0^{\circ}\text{F, zero pressure}) - (120^{\circ}\text{F, zero pressure})}{(0^{\circ}\text{F, zero pressure}) - (0^{\circ}\text{F, full pressure})} \times \frac{100}{120}$$

$$\text{Percentage Sensitivity Change} = \frac{(0^{\circ}\text{F, full pressure}) - (120^{\circ}\text{F, full pressure})}{(0^{\circ}\text{F, zero pressure}) - (0^{\circ}\text{F, full pressure})} \times \frac{100}{120}$$

The results of these tests are presented in Figures 18 and 19. These figures show the distribution of zero shift and sensitivity as a function of the number of units tested. In the final selection of the transducers for this program it was found that the temperature effect was the critical factor.

## 2. Linearity, Hysteresis, Repeatability

For these tests, eight transducers were connected to a manifold as shown in Figure 17 and the output of each transducer was recorded on a CEC oscillograph through the CEC System D amplifiers. The pressure applied was measured with a manometer. The room temperature of 76 degrees Fahrenheit did not vary more than 0.5 degrees Fahrenheit while data were being taken.

Linearity, hysteresis, and repeatability were checked simultaneously. The transducers were calibrated at 0 per cent,  $\pm 25$  per cent,  $\pm 50$  per cent,  $\pm 75$  per cent and  $\pm 100$  per cent of full range. Pressure was applied in increments up to full range, then reduced to zero in steps. Care was taken when applying the pressure so that no overshoot occurred. In this manner the linearity and hysteresis were checked. The 50 per cent and 100 per cent points were run twice more at ten minute intervals to obtain the repeatability data.

The results indicated that the combined error due to linearity, hysteresis and repeatability was within plus or minus 2 per cent of full scale output.

## 3. Vibration

The transducers were placed in the test fixture and vibrated with an acceleration of  $\pm 20$  g's. This test was to ascertain if any of the transducer coils were loose. They were mounted in the same manner as they would be mounted in the blade so that no output would be obtained from stressing the case of the transducers. No output due to vibration was obtained from any of the transducers tested.

## V. FLIGHT TESTS

The flight test portion of the program was conducted during August through October, 1961. The helicopter configuration and instrumentation are defined in previous sections.

Several preliminary flights were required to prepare for the data flights. These flights were made to track and balance the rotor, to functionally check the instrumentation, to adjust and position oscillograph traces, and to check for pressure transducer outputs due to centrifugal force or "noise." After the initial flights, the pilot commented that track and balance with the instrumented rotor were good and comparable to a standard HU-1A rotor.

It was found during these flights that several pressure transducer traces apparently contained hash or "noise." Several orifices were sealed and flights were made to check this condition. No outputs were recorded from the sealed transducer; therefore, it was assumed that all outputs recorded previously were due to air pressure.

A total of 12 flights requiring 6.4 hours was required to complete the program. A log of these flights is given in Table 2.

Flights number 7A, 10A, 10B, 10C, and 12A were conducted to record data. All such flights were performed early in the morning to take advantage of cool temperatures, smooth air, and low wind velocities. A list of these flight conditions is presented in Table 3, in which weather conditions and pilots' comments are also given. This table presents data recorded by the observer prior to and during each flight condition. One of the readings recorded by the observer was the amount of fuel consumed. During straight and level flight conditions, the weight of the fuel consumed was used to calculate the change in gross weight so that the altitude could be changed and gross weight/density ratio could be held nearly constant.



## VI. DISCUSSION, REDUCTION, AND PRESENTATION OF DATA

### A. METHODS OF CALIBRATION AND SIGN CONVENTIONS

The following paragraphs describe the methods used to calibrate the instrumented parts and equipment of the test helicopter. The sign conventions used are also noted. Right and left are determined while seated in the helicopter facing forward; positive deflection on the oscillograph paper is for the trace moving up.

#### 1. Attitude and Rate Gyroscopes

The attitude gyros were calibrated using a tilt table and a precision inclinometer. The rate gyros were calibrated on a Genisco rate of turn table.

For a preflight calibration, the helicopter was leveled and an oscillograph recording of the attitude gyro trace was made to establish a reference point. There was no preflight calibration of the rate gyros. The calibration curves for the attitude and rate gyros are shown in Figures 20 and 21.

The sign conventions for these gyros are given below:

##### Attitude Gyro:

Positive (+) Roll: Top of mast is right  
Positive (+) Pitch: Nose of helicopter is up  
Zero: Helicopter level on both axes

##### Rate Gyro:

Positive (+) Roll: Top of mast moves right  
Positive (+) Pitch: Nose of helicopter moves up  
Positive (+) Yaw: Nose of helicopter moves right  
Zero: No motion

#### 2. Position Indicators

The position indicators were calibrated after being installed on the helicopter. With the exception of the main rotor pylon, all position indicators were calibrated with a protractor. The pylon position indicators were calibrated with a dial indicator. For various deflections, the position indicator outputs were recorded on the oscillograph. A 100K ohm resistance calibration was also recorded. The outputs of the pylon position indicators were also recorded while the ship was level and the mast angle was measured and recorded during the preflight check.

Zero for the flap and pitch position indicators was determined prior to each test flight by operating the helicopter on the ground with the collective full down and recording the traces. The average value of the flap and pitch traces was used as the zero. For the pitch trace, this zero or reference point is defined as the low blade angle which is +9.5 degrees at Station 23 on the blade. Positive deflection for the pitch

trace was for the leading edge of the red blade rotating up. Positive deflection for the flap trace was for the red blade moving up. A 100K resistance calibration was used to establish the sensitivity of the blade pitch trace. All other position indicators were calibrated during the preflight checks by moving the appropriate controls to their limits. The calibration curves for all position indicators are shown on Figures 22a through 22m. The sign conventions for the various position indicators are given below:

Rudder Pedal:

Positive (+): Right rudder  
Zero: Neutral pedal position the middle of full travel on the oscillograph

Fore and Aft Cyclic:

Positive (+): Stick forward  
Zero: Swashplate perpendicular to mast

Lateral Cyclic:

Positive (+): Stick to right  
Zero: Swashplate perpendicular to mast

Collective:

Positive (+): Stick up  
Zero: Collective stick full down

Stabilizer Bar:

Positive (+): Upward movement of the side of the stabilizer bar attached to the instrumented blade control links

Pylon:

Positive (+): Pylon mount increasing in length (pylon moving up)

Angle of Attack Vanes:

Positive (+) Yaw: Nose of helicopter is to right  
Positive (+) Pitch: Nose of helicopter is up  
Zero: Vanes parallel with axes of helicopter

3. Main Rotor Strain Gage

The main rotor assembly was installed on a dummy mast which was fastened to the floor so that the beam and chord bending bridges and the torsion bridges could be calibrated. The appropriate loads were applied and the bridge outputs were recorded. Calibration curves showing the output versus bending moment or torsion are presented by Figures 23a through 23r.

During the calibration, a fixed precision resistor ( $\pm .5$  per cent) was connected across one leg of the bridge. The output produced by this unbalance is indicated on the curves. A corresponding load value is defined as the calibrate equivalent. A calibrate equivalent was recorded for all strain gage bridges.

All blade strain gages were calibrated during the preflight check using a 100K precision resistor. The sign conventions for these gages are:

Beam Bending Positive (+): Top of blade in compression  
Torsional Positive (+): Blade trailing edge rotated up  
Zero: Reference point with rotor stopped  
(A droop correction factor is subtracted from in-flight readings to obtain zero)  
Chord Bending Positive (+): Leading edge of blade in tension

#### 4. Pressure Transducers

The pressure transducers were calibrated after the rotor and related instrumentation were installed on the helicopter. The system D amplifiers used in conjunction with the transducer have a reference phase control. The output or sensitivity of the amplifier is dependent on that control. Therefore, the reference phase control was adjusted prior to the calibration of the system and was not changed during the remainder of the program.

Each transducer was calibrated throughout its pressure range with a mercury or water manometer as the indicating device for pressure; the transducer output was recorded on an oscillograph. The calibration curves for the pressure transducers as installed in the main rotor blade are presented by Figures 24a through 24f.

For a preflight calibration, all main rotor blade pressure transducers were checked by applying a known vacuum to each transducer. The vacuum was measured with a manometer. These calibration results are presented in Tables 4a through 4f (see Section VI-B-1 for a more complete discussion of these data). The sign conventions for the transducers are:

Positive (+): Pressure on top surface of blade lower than pressure on bottom surface  
Zero: Pressure on bottom surface equals pressure on top surface

#### 5. Control Tubes

All components used to measure control system loads were instrumented with tension bridges. For calibration, the components were loaded on a Baldwin Universal tester and the output was recorded on a microammeter. The calibration curves for these parts are shown by Figures 25a through 25f. All strain gaged control tubes were calibrated with a 100K ohm precision resistor during the preflight check.

The sign convention for the control tubes is:

Positive (+): Tension in tube

#### 6. Accelerometers

The accelerometers were calibrated at the helicopter. The difference in output between the accelerometer sitting on its base and the accelerometer inverted was recorded on an oscillograph. The 2g inversion was used as the calibrate. The accelerometers were calibrated with a 100K ohm precision resistor during the preflight check.

The accelerometer sign conventions are:

Vertical, Positive (+): Accelerometer case moving up  
Fore and Aft, Positive (+): Accelerometer case moving forward  
Lateral, Positive (+): Accelerometer case moving right

#### 7. Photo Panel Instruments

All photo panel instruments were calibrated on the appropriate test device in the contractor's Standards and Calibration Laboratory prior to installation on the helicopter. In addition, the airspeed indicator was calibrated in flight with a trailing bomb device. The calibration curves for the photo panel instruments are presented in Figures 26a through 26g. There was no preflight calibration for the photo panel instruments.

#### 8. Blade Azimuth Indication

Blade azimuth indication was accomplished by positioning a trace interrupter on the swashplate (Figure 27) to produce 24 indications ( $360^\circ/24 = 15^\circ$  apart) per revolution. Blade azimuth position was equal to zero degrees when the red blade was over the tail boom. When viewed from above, the main rotor rotates counterclockwise.

### B. SENSITIVITIES

#### 1. Type I Flight Conditions

Tables 4a through 4f list the oscillograph channel, the trace zero position, the calibration constant, and the droop, where applicable, for all six oscillographs for the Type I flight conditions. The calibration constant or sensitivity is a term expressed in the appropriate units per inch which relates the trace deflection to the quantity being measured.

The trace zero is the reference position for all traces. It is the distance in inches from the reference line at the bottom of the oscillograph to the zero position for all traces.

Referring to Tables 4a through 4f, there are numbers in the column marked "Droop" for the beam bending, pitch position, and vertical acceleration channels. The droop readings for the beam bending channels indicate the negative bending moments for each beam channel caused by the blade's own weight. These droop readings must be subtracted from the in-flight readings to obtain a true zero.

The blade pitch position zero was recorded with the collective control full down. At this position the pitch of the blade was +9.5 degrees at the reference Station 23. Therefore, +9.5 degrees is shown in the "Droop" column and must be added to all in-flight readings to obtain the true blade angle at Station 23. The twist of the blade is -10 degrees 57 minutes from Station 23 to the tip.

The vertical accelerometer indicated one (1) g when the zero record was taken; therefore, one (1) g is shown in the "Droop" column and is to be added to all in-flight readings.

## 2. Type II Flight Conditions

Tables 5a through 5f list the oscillograph channel, the trace zero position, the calibration constant and the droop for all six oscillographs. The discussions of Paragraph 1, above, apply to the Type II records; however, certain channels were deleted and the trace sensitivities were increased for the Type II flight conditions.

## C. ACCURACY

A detailed study to establish the absolute accuracy of each of the 94 channels of instrumentation discussed herein is outside the scope of the program. An evaluation of the over-all system, however, has indicated that over-all errors in the tabulated data of  $\pm 5$  to 7 per cent are to be expected.

## D. DATA PROCESSING

### 1. Data Reading

a. Photo Panel - Information recorded by the photo panel camera included airspeed, altitude, engine and rotor r.p.m., gas producer r.p.m. (per cent), and engine high and low torque. Counter numbers on the film and a mark on the oscillograph records produced by the camera shutter, allowed correlation between photo panel and oscillograph records.

b. Oscillograph - The oscillograph records were read using the Benson-Lehner OSCAR system at the contractor's facility. The OSCAR system consists of a Model E Oscillograph Trace Reader, a Model E Decimal Counter, a Model B Electrotyper, and an IBM 026 Key punch.

To read oscillograph records using the OSCAR, the record was placed on a reading table and a hairline representing the X axis and one representing the Y axis were aligned over the point to be read. With the hairlines aligned, a button was depressed and the data point was typed on a record sheet and punched on an IBM card. The deck of punched cards served as an input to the IBM 650 computer used during the program.

## 2. Data Grouping

The various types of data can be conveniently grouped according to reduction procedures. These data groups are listed and discussed briefly in the sections below.

### a. Group I

	<u>IA</u>	<u>IB</u>
Photo Panel	1. Airspeed	1. True airspeed
	2. Pressure altitude	2. Density altitude
	3. Engine r.p.m.	3. Rotor r.p.m.
	4. O.A.T.	4. Engine power
	5. $N_1$ (per cent)	
	6. High torque, engine	
	7. Low torque, engine	
Oscillograph	8. Pitch rate	5. Pitch rate
	9. Roll rate	6. Roll rate
	10. Yaw rate	7. Yaw rate
	11. Pitch attitude	8. Pitch attitude
	12. Roll attitude	9. Roll attitude
	13. Fore & aft cyclic position	10. Fore & aft cyclic position
	14. Lateral cyclic position	11. Lateral cyclic position
	15. Collective position	12. Collective position
	16. Rudder position	13. Rudder position
	17. Boom, angle of attack vane	14. Angle of attack
	18. Boom, yaw vane	15. Yaw

In all cases the data of Group IA were used to obtain Group IB which are tabulated. The photo panel data were corrected using the instrument calibration curves and were used to calculate true airspeed, density altitude, and engine power. True rotor r.p.m. was read using the azimuth indication on the oscillograph records and the oscillograph timing lines.

b. Group II (Oscillograph - 16 Channels)

1. Vertical acceleration (center of gravity)
2. Lateral acceleration (center of gravity)
3. Fore and aft acceleration (center of gravity)
4. Blade pitch position
5. Blade flap position
6. Right hand cyclic tube
7. Left hand cyclic tube
8. Collective tube
9. Lift link
10. Right front pylon position
11. Right aft pylon position
12. Left front pylon position
13. Left aft pylon position
14. Pitch link - red
15. Pitch link - white
16. Stabilizer bar position

c. Group III - Differential Pressure (Oscillograph - 42 Channels) -

Group III data are the differential blade pressures for the various span and chord locations listed in Section IIIC2.

d. Group IV - Strain Gage (Oscillograph - 18 Channels) -

Group IV data are the beam and chord bending and torsion gages listed in Section IIIC1. The gages include:

	Quantity on Red Blade	Quantity on White Blade	Total
Beam Bending	8	2	10
Chord Bending	4	2	6
Torsion	2	-	2
		Total channels	18

3. Data Reduction

a. Steady State, Type I Flight Condition - Seven steady state conditions from Flight 10 were reduced using Bell Helicopter Company IBM Program B02. These steady state conditions are listed below:

TYPE I STEADY STATE FLIGHT CONDITIONS

Condition Number	Counter Number	Flight Condition	I.A.S. Knots	Rotor r.p.m.
23	561	Maximum power climb	22	314
27	565	Straight and level flight	30	314
29	567	Straight and level flight	80	314
31	569	Straight and level flight	$V_{max}$ 105	314
42	581	Hover ( $Z/D = 1.5$ )	0	314
55	603	Altitude, stall threshold	75	324
58	606	Altitude, before stall threshold	60	324

The various data groups were reduced as described in the paragraphs below:

(1) Group IA and Group IB Data - The 18 data sources of Group IA were read once at a rotor azimuth angle of 180 degrees for each of the three rotor revolutions used for the differential pressure and moment data. These three readings were averaged to calculate the data for Group IB and the data in Group IB are tabulated for each steady state condition.

(2) Group II - Group II oscillograph channels were read and punched on IBM cards by use of the OSCAR system at each 30 degrees of azimuth for three rotor revolutions (12 points/rev. x 3 rev. = 36 points). The computer was programmed so that corresponding points of the three revolutions were examined, the two closest values were averaged, and the third rejected. The average values are tabulated for the 12 azimuth positions for each channel and were harmonically analyzed to give the steady value through the fifth harmonic components. The sine and cosine components, and the resultant and phase angle are tabulated. The "averaging" method described herein was used for all data in Groups II, III and IV.

(3) Group III - Group III pressure data were read 12 times per revolution for three rotor revolutions and averaged as discussed above. The 12 average values were tabulated for each channel and processed as discussed below.

(a)  $\Delta P$  versus Chord - Curves of  $\Delta P$  versus per cent chord were plotted using the averaged values for each of the six spanwise stations, for each 30 degrees of azimuth, and for each steady state flight condition. Therefore,  $6 \times 12 = 72$  curves are given for each steady state flight condition.

(b) Thrust/Inch versus Azimuth and Radius - The 72 differential pressure versus chord curves were integrated and the results were tabulated as thrust per inch versus azimuth at each spanwise station and as thrust per inch versus span for each azimuth position. Curves of air load per inch versus azimuth (six curves) and curves of air load per inch versus per cent radius (12 curves) were plotted and presented herein.

The curves of air load versus azimuth were harmonically analyzed for the steady through the fifth harmonic component. The results were tabulated in the form of sine and cosine components, and the resultant and phase angle.

(c) Thrust/Blade versus Azimuth - The curve of air load versus per cent radius was integrated to give blade thrust versus azimuth (12 points), and the data were plotted.

The curves of blade thrust versus azimuth were harmonically analyzed to determine the steady through the fifth harmonic components. The sine and cosine components, and the resultant and phase angle were tabulated.



(4) Group IV - For the same three rotor revolutions used for the pressure data, the 18 strain gage channels were read at each 30 degrees of azimuth, the three corresponding readings were averaged as previously discussed, and the values were tabulated for each channel.

Curves of moment or torsion versus azimuth were plotted for each channel and each curve was harmonically analyzed for the steady through the fifth harmonic component. The results were tabulated as sine and cosine components, and the resultant and phase angle. Curves of beam and chordwise moment versus per cent radius were plotted and are given herein.

b. Maneuvers, Type I Flight Conditions - Data for two maneuver flight conditions of Flight 10 were reduced using Bell Helicopter Company IBM 650 Program B03. These are listed below:

TYPE I MANEUVER FLIGHT CONDITIONS

Condition Number	Counter Number	Flight Condition	Indicated Airspeed Knots	Rotor Speed r.p.m.
34	572	Symmetrical pull-up	80	314
38	576	Approach and flare	50-0	314

Five rotor revolutions, spaced approximately one second apart, were reduced for each maneuver condition. The results of all five revolutions are presented and no averaging was required. Figure 28 shows a time history of the vertical acceleration for Condition 34 with the five rotor revolutions indicated on the curve to show where the revolutions occurred during the maneuver. For Condition 38, Figure 29 shows a time history of collective stick position with the five rotor revolutions indicated on that curve. The following paragraphs describe the handling of the various data groups for the maneuver flight conditions.

(1) Group I - The channels in Group IA were read once during each revolution at approximately the 180-degree azimuth position. The data in Group IA were used to calculate the data in Group IB and the IB data were tabulated for each revolution.

(2) Group II - Each channel in Group II was read 12 times per revolution (each 30-degree azimuth position) for the five revolutions. The variation of each trace versus azimuth was harmonically analyzed for each of the five revolutions to give the steady through the fifth harmonic. The sine and cosine, and the resultant and phase angle were tabulated.

(3) Group III - The 42 differential pressure channels were read 12 times per revolution (each 30 degrees of azimuth) for the five revolutions and the data were tabulated. The variation of differential pressure versus chord was integrated at each spanwise station and at each azimuth position for each revolution. The result of the integration is

the thrust per inch versus azimuth for each of the five revolutions. The variation of thrust per inch versus azimuth was harmonically analyzed for each spanwise station and each revolution to give the steady through the fifth harmonic components. The sine and cosine components, and the resultant and phase angle were tabulated.

(4) Group IV - The 18 strain gage channels were read 12 times per revolution (each 30 degrees of azimuth) for each of the five revolutions. The variation of moment or torsion versus azimuth was harmonically analyzed for each revolution to give the steady through the fifth harmonic. The sine and cosine components, and the resultant and phase angle were tabulated.

c. Steady State, Type II Flight Condition Data - Four steady state conditions from Flight 12 were reduced using Bell Helicopter Company IBM Program B15. These steady state conditions are:

TYPE II STEADY STATE FLIGHT CONDITIONS

Condition Number	Counter Number	Flight Condition	Indicated Airspeed Knots	Rotor Speed r.p.m.
65	694	Straight and level flight	30	314
66	696	Straight and level flight	80	314
67	697	Straight and level flight	105	314
68	698	Straight and level flight	105	324

For these flight tests and the succeeding data reduction, the sensitivities of the oscillograph traces were approximately doubled, the oscillograph paper speed was doubled, and a 24-point (each 15 degrees of azimuth) harmonic analysis of the data was employed. Because of the increase in sensitivity, it was necessary to delete certain traces from the oscillograph records so that the traces would be readable. The channels are grouped below as discussed in Section D2 ; however, with certain deletions, Table 1 shows the oscillograph setup used. For comparing the results of the 12 and 24-point harmonic analyses, the data of Condition No. 29 from the Type I conditions (Flight 10) were harmonically analyzed using the 24-point Type II Program, B15.

(1) Group I - The Group I data were reduced as explained in Section 3a(1).

(2) Group II - The Type II data of Group II which included only blade pitch and flap position, were read 24 times per revolution (each 15 degrees of azimuth) for three rotor revolutions. The computer was programmed as before so that corresponding points of the three revolutions were examined, the two closest values were averaged, and the third rejected. The variation of the averaged values versus azimuth

was harmonically analyzed to give the steady through the eleventh harmonic. The sine and cosine components, and the resultant and phase angle were tabulated.

(3) Group III - The seven pressure channels at the 55 per cent blade radius were deleted. The remaining 35 channels were read 24 times per revolution (each 15 degrees of azimuth) for three rotor revolutions and averaged as described above. The variation of each pressure channel versus chord was integrated to obtain thrust per inch for each spanwise station and each of the 24 azimuth positions. The variation of thrust per inch versus azimuth was harmonically analyzed for the steady through the eleventh harmonic, the sine and cosine components, and the resultant and phase angle were tabulated.

The variation of thrust per inch versus span was integrated for each of the 24 azimuth positions to obtain the total thrust per blade versus azimuth. The variation of total blade thrust was harmonically analyzed to give the steady through the eleventh harmonic. The sine and cosine components, and the resultant and phase angle were tabulated.

(4) Group IV - Blade Strain Gages - Only eight beam bending channels and two torsion channels for the red blade from Group IV data were recorded during these flights. These data were processed in the same manner as the Group II, Type II data above.

d. Method of Integration - Weighting Factors - To obtain the highest accuracy possible from the numerical integrations of the subject pressure data, considerable attention was given to the integration procedure. A modified version of Legendre-Gauss quadrature was considered. A discussion of this approximation is given in Hildebrand, Introduction to Numerical Analysis (Reference 13, page 323). Based on the USATRECOM H-34 program at NASA, chordwise and spanwise transducer locations and weighting factors were specified by the contracting agent to optimize the integration accuracy. Later, some changes in weighting factors were required due to final gage locations and to inoperative gages.

For one blade station, plots were made of chordwise differential pressure distributions for several azimuth positions and areas under the curves measured with a planimeter. The quantities so measured were checked against the computer output values and found to agree. This validated both the weighting distribution used and the computer routine. Other spot checks of this type were made and some further adjustments in weight distributions resulted. The details of the method of integration and weight factors used in Bell Helicopter Company IBM 650 Programs B02, B03, and B15 are given in the following pages.

The approximations used to determine the thrust/inch of blade ( $\frac{dT}{dr}$ ) and the thrust (T) are of the following form:

$$\frac{dT}{dr} = \int_0^C \Delta P(x) dx = C \sum_{i=1}^n W_i \Delta P_i$$

$$T = \int_0^R \frac{dT}{dr} dr = R \sum_{i=1}^m W_i \left( \frac{dT}{dr} \right)_i$$

where

$\frac{dT}{dr}$  = Air loading at a given spanwise station (lbs/inch)

T = Thrust of one blade at a given  $\Psi$  (lb)

R = Main rotor blade radius (inches)

C = Chord length (inches)

$\Delta P$  = Differential pressure (psi)

n = Number of chordwise stations (5, 6, 7, or 10)

m = Number of spanwise stations (5 or 6)

The  $W_i$  values are weighting factors. There is a different set of  $W_i$  values for each value of n or m. The values used are listed below:

#### CHORDWISE WEIGHTING FACTORS

Radius (%R)	85	55, 75, 90	95	40			
	(10 Gages)	(7 Gages)	(6 Gages)	(5 Gages)			
<u>% Chord</u>	<u>W<sub>i</sub></u>	<u>% Chord</u>	<u>W<sub>i</sub></u>	<u>% Chord</u>	<u>W<sub>i</sub></u>		
2	.02	2	.044	2	.044	4	.10
4	.04	9	.082	9	.082	17	.10
9	.045	17	.082	17	.082	34	.222
13	.045	23	.044	23	.113	63	.355
17	.05	34	.208	34	-	88	.222
23	.085	63	.333	63	.472	-	-
34	.195	90	.208	90	.208	-	-
47.7	-	-	-	-	-	-	-
63	.220	-	-	-	-	-	-
77	.135	-	-	-	-	-	-
90	.165	-	-	-	-	-	-

# SPANWISE WEIGHTING FACTORS

Type I Data 6 Stations		Type II Data 5 Stations	
% Radius	$\underline{W_i}$	% Radius	$\underline{W_i}$
40	.225	40	.312
55	.175	55	-
75	.150	75	.238
85	.075	85	.075
90	.050	90	.050
95	.050	95	.050

e. Method of Harmonic Analysis and Discussion - The method of harmonic analysis used in Bell Helicopter Company IBM 650 Programs B02, B03, and B15 is developed in R. G. Manley, Wave Form Analysis (Reference 14, page 186). The equations used in the programs are as follow:

$$A_0 = \frac{1}{N} \sum_{r=1}^N f(\psi_r)$$

$$A_k = \frac{2}{N} \sum_{r=1}^N f(\psi_r) \cos(k\psi_r)$$

$$B_k = \frac{2}{N} \sum_{r=1}^N f(\psi_r) \sin(k\psi_r)$$

$$\text{Max}_k = + \sqrt{A_k^2 + B_k^2}$$

$$\phi_k = \frac{\text{arc tan } \frac{B_k}{A_k}}{k}$$

where

$A_0$  = steady value

$A_k$  = cos component

$B_k$  = sin component

$f(\psi_r)$  = value, at azimuth position  $\psi_r$ , of the function to be analyzed

$k = 1, 2, 3 \dots (\frac{N}{2} - 1)$

N = number of readings per main rotor revolution

$\phi_k$  = phase angle, referred to one per rev frequency

To evaluate the effect of computer accuracy on the higher harmonics of the Type II program, a simple test was made. From trigonometric tables, two sine functions were added to construct the curve. The first function had a maximum value of one (1), and the length of the cycle was the same as that for one rotor revolution on the Type II oscillograph records. The second curve had a maximum value of .5 and was twice the frequency of the first and in phase. The resulting curve was plotted and photographically reduced to the one-half size shown in Figure 30, and that figure was read and harmonically analyzed as was the data of the subject program. The results of this work are listed below. The maximum value of any sine component above the second is .006 for the third harmonic. The eleventh is .002. This compares to values of -.08 to +.05 for the eleventh harmonic of the flapping trace from the Type II flight test data.

#### HARMONIC CONTENT OF TWO-PER-REV SINE CURVE

Steady Value = 1.5008

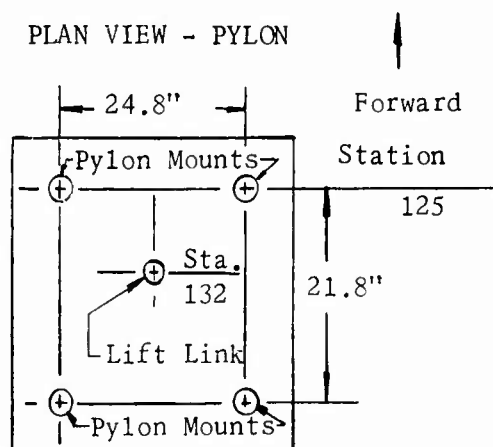
Harmonic	Cosine	Sine	Maximum	PHI (Degrees)
1	.00356	.50277	.50278	89.594
2	.00167	.24830	.24830	44.808
3	.00142	.00628	.00644	25.745
4	.00333	.00144	.00363	5.853
5	.00265	.00322	.00417	10.116
6	-.00083	.00583	.00589	16.355
7	.00296	.00209	.00363	5.030
8	.00167	.00433	.00464	8.619
9	.00024	-.00039	.00046	33.582
10	.00167	.00004	.00167	0.126
11	-.00084	.00223	.00238	10.052

Also, a set of IBM cards was punched for a pure sine curve using trigonometric table data rounded off to two decimal places as does the OSCAR (OSCAR accuracy is  $\pm .01$  of an inch.). The maximum value was unity. This curve was harmonically analyzed using a 24-point input. The results are shown below. The maximum harmonic components were the fifth and seventh with a value of .001 and the eleventh was .00095. Therefore, the value of the higher harmonic components obtained by the reduction of the Type II data is not due to computer round-off. Additional checks were made to evaluate reading error and these were found to be negligible also.

# HARMONIC CONTENT OF SINE CURVE

Harmonic	Cosine	Sine	Maximum	PHI (Degrees)
1	.00000	1.00324	1.00324	89.999
2	.00000	.00000	.00000	163.002
3	.00000	.00000	.00000	74.847
4	.00000	.00000	.00000	6.804
5	.00000	-.00110	.00110	54.001
6	.00000	.00000	.00000	8.938
7	.00000	.00120	.00120	12.858
8	.00000	.00000	.00000	35.005
9	.00000	.00000	.00000	22.478
10	.00000	.00000	.00000	35.084
11	.00000	.00095	.00095	8.183

PLAN VIEW - PYLON



## f. Pylon Position Indicator

The adjacent sketch is presented to show the location of the pylon position indicators. The lift link location is also indicated on the sketch.

A pylon position indicator was used to measure the vertical motion of each of the four pylon mounts. By using the dimensions shown above and by using the motions of any three pylon position indicators,

the mast angle with respect to the helicopter fuselage can be calculated.

## E. DATA PRESENTATION

### 1. Table of Flight Conditions Recorded

Table 3 presents a list of all steady state and maneuver flight conditions for which oscillograph and photo panel data were recorded. The column labeled Condition No. is used throughout this report to refer to a particular steady state or maneuver flight condition. Flights 10A, 10B, and 10C were conducted to record Type I data. Flight 12A was conducted to record data for the Type II program.

### 2. Group IB Data

The data included in Group IB were discussed in Section VID2. These tables present information for ship attitude, control positions, airspeed, attitude, horsepower, gross weight, etc. No harmonic analyses were required for these data; their principal purpose is to define the flight condition. Tables 6a through 7d present Group IB data for the

three revolutions of each steady state condition. Tables 8a and 8b present Group IB data for the five revolutions of the two maneuvers.

### 3. IBM Tabulations

Notes: In general, blank spaces appearing in tabulated columns are equivalent to zero (0); however, pressure transducers at 85 per cent radius, 47.7 per cent chord and 95 per cent radius, 34 per cent chord were inoperative and no print out is given.

The decimal point for each data point presented is indicated by the last two digits as shown by the examples below.

3540000051 = 3.540

3540000050 = .354

3540000049 = .0354

A negative number is indicated by a minus (-) sign after the last digit.

3540000051- = -3.540

#### a. Steady State Flight Conditions

(1) Type I Data (B02 Program) - IBM tabulation Numbers 1 through 7 present the IBM listings for the seven Type I steady state flight conditions. The harmonic analyses column headings are labeled COSINE, SINE, MAX, and PSI ( $\psi$ ). MAX refers to the resultant; PSI ( $\psi$ ) is the phase angle. IBM tabulation Number 8 gives Condition No. 29 reduced in the same manner as the Type II data described below. This was done to evaluate the effect of the data reduction methods.

The right column contains numbers of the form

XXX Y Z WW

X, XX, or XXX is the data code number. This 1, 2, or 3 digit number was used by the computer for sorting.

For the raw data listing, Y is the line number 7, 8, or 9.

7 is the line for 0, 30 degrees, 60 degrees, 90 degrees.

8 is the line for 120 degrees, 150 degrees, 180 degrees, 210 degrees.

9 is the line for 240 degrees, 270 degrees, 300 degrees, 330 degrees.

For the harmonic analysis, Y is 0, 1, 2, 3, 4, 5. The numbers 1 through 5 indicate the harmonic component and zero is the steady value.



Z is the oscillograph number. A zero indicates calculated data whose components were obtained from more than one oscillograph.

WW is the flight condition number.

Examples: On Page 242 the differential pressure at the 40 per cent blade radius station, 17 per cent chord, and at 330 degrees azimuth is 1499850051 = 1.50 pounds per square inch. The right column contains the number 2 9 1 23

2 = sorting number  
9 = line for last four azimuth readings  
1 = data recorded on Oscillograph No. 1  
23 = flight condition number

On Page 247 the fourth harmonic sine component of the blade loading at 40 per cent radius is 2001803050- = -.20 p.s.i. The right column contains the number 7 4 0 23.

7 = sorting number  
4 = fourth harmonic component  
0 = data from more than one oscillograph  
23 = Flight Condition No. 23

(2) Type II Data, B15 Program - IBM tabulations 9 through 12 present the IBM listings for the Type II data. The harmonic analyses headings are labeled the same as the Type I Maneuver Data. Since only the harmonic analyses of the Type II data are presented, the channels are not named and must be identified by the channel identification number. The left hand column contains a number of the form,

XX 0 YY 00 ZZ

X or XX is the channel identification number which is listed below.

0 is a spacer.

YY is the flight condition number.

00 is a spacer.

ZZ is the harmonic component index. Zero is the steady value, and 1 through 11 are the first through the eleventh harmonic components.

Example: On Page 370 the left hand column marked COEF contains the number 3 0 68 00 07.

3 = red blade beam bending, 36 per cent radius  
0 = spacer  
68 = flight condition number  
00 = spacer  
07 = seventh harmonic

The seventh harmonic cosine component is 7870508752-  
= -78.7 inch-pounds.

Following are the channel identification numbers for Type II data:

1. Red Blade Beam Bending	15% R
2. Red Blade Beam Bending	28% R
3. Red Blade Beam Bending	36% R
4. Red Blade Beam Bending	45% R
5. Red Blade Beam Bending	60% R
6. Red Blade Beam Bending	65% R
7. Red Blade Beam Bending	80% R
8. Red Blade Beam Bending	92.5% R
9. Red Blade Torsion	15% R
10. Red Blade Torsion	50% R
11. Red Blade Pitch Position	
12. Red Blade Flap Position	
13. Blade Loading	40% R
14. Blade Loading	75% R
15. Blade Loading	85% R
16. Blade Loading	90% R
17. Blade Loading	95% R
18. Total Blade Thrust	95% R

b. Maneuver Data, B03 Program - IBM tabulations 13a through 14e present the listings for the two maneuver flight conditions. The harmonic analyses column headings are labeled COSINE, SINE, MAX, AND PHI ( $\phi$ ). MAX refers to the resultant; PHI is the phase angle.

The right hand column of the harmonic analysis data contains a number of the form

XXX 0 YY WW Z

A blank space, XX, or XXX is the time in seconds.

A blank space represents zero time for the first revolution that was reduced.

The second revolution occurred .XX (for Condition No. 38) or X.XX (for Condition No. 34) seconds later. The third revolution occurred X.XX seconds from the start, etc.

YY is the condition number.

WW is the channel identification for the computer.

Z is 0, 1, 2, 3, 4, 5; zero is the value of the steady component, and 1 through 5 are the first through the fifth harmonic components.

Example: On Page 431 the second harmonic sine component of the vertical acceleration is 6065208349 = +.06 g. The right hand column for the line contains the number 38 53 2

The XXX 0 is missing and only the YY WW Z is shown.

XXX is missing or blank because time = zero

38 = flight condition number

53 = channel identification for the computer

2 = second harmonic

Figure 28 shows a time history of the vertical acceleration for Condition 34, the symmetrical pull-up maneuver. Figure 29 shows a time history of the collective stick position for Condition 38, the approach and flare maneuver. The five rotor revolutions that were reduced are shown on the curves.

#### 4. Graphs

Since over 900 curves were to be plotted, it was decided that the curves would be plotted by a machine process. The machine used was an Electronic Associates, Inc., Dataplotter, Model 3033D. Input to the machine was by means of IBM cards.

The accuracy of the graphs was limited by the accuracy of the graph paper. The maximum error of any plotted point in this report is plus or minus one-sixty-fourth of an inch.

The types of graphs listed below are given by Figures 31 through 37. Each figure number consists of parts a through o; these letter designations correspond to the titles given below. These graphs are presented for each of the steady state Type I flight conditions.

- a.  $\Delta P$  vs Chord    40% R for all azimuth positions.
- b.  $\Delta P$  vs Chord    5% R for all azimuth positions.
- c.  $\Delta P$  vs Chord    75% R for all azimuth positions.
- d.  $\Delta P$  vs Chord    85% R for all azimuth positions.
- e.  $\Delta P$  vs Chord    90% R for all azimuth positions.
- f.  $\Delta P$  vs Chord    95% R for all azimuth positions.
- g. Air load vs per cent radius.
- h. Air load vs azimuth.
- i. Total thrust/blade vs azimuth.
- j. Beam moment vs per cent radius.
- k. Beam moment vs azimuth.
- m. Chord moment vs per cent radius.
- n. Chord moment vs azimuth.
- o. Torsion vs azimuth.

#### 5. Oscillograph Records

a. Maneuver Conditions - Five rotor revolutions of a symmetrical pull-up and an approach and flare were reduced. From the five revolutions reduced, Revolutions 1, 3, and 5 were cut from each of the six oscillograph records and are presented for each maneuver.

Figure 28 presents a time history of the vertical acceleration during Condition No. 34, a symmetrical pull-up. The five rotor revolutions that were reduced are marked on the curves to indicate where the revolutions occurred during the maneuver. Figures 38a through 38f are full scale reproductions of the selected oscillograph records.

Figure 29 presents a time history of the collective control position for Condition No. 38, an approach and flare. The five rotor revolutions that were reduced are also indicated on the curves of this figure. Figures 39a through 39f are full scale reproductions of the six oscillograph records.

b. Type I and Type II Steady State Condition (Sample) - Figures 40a and 40b show sections from the oscillograph records for the Type I high speed flight conditions. One rotor revolution from each of the six oscillographs for Condition No. 31 is shown.

Figures 41a through 41c show sections from the oscillograph records for the Type II high speed flight, Condition No. 67. One rotor revolution from each of the six oscillographs is shown.

## REFERENCES

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3. Rabbot, J. P., Jr., and Churchill, G. B., Experimental Investigation of the Aerodynamic Loading on a Helicopter Rotor Blade in Forward Flight, NACA Research Memo L 56107, Langley Field, Virginia, October 25, 1956.
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6. Patterson, J. L., A Miniature Electrical Pressure Gage Utilizing a Stretched Flat Diaphragm, NACA Technical Note 2659, Langley Field, Virginia, April, 1952.
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8. Hafer, C. A., Environmental Evaluation of Slip Ring Assembly, Southwest Research Institute, San Antonio, Texas, February 9, 1961.
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11. Dummigan, J. P., Fatigue Test of HU-1A Main Rotor Blade Modified for Dynamic Air Load Survey, Bell Helicopter Company, Report 299-099-162, Fort Worth, Texas, September 8, 1961.

12. Hill, J. C., Letter to USATRECOM, Subject: Fatigue Life Substantiation for Dynamic Air Loads Measurement Blade, Bell Helicopter File Number 81:JCH:df-480, May 25, 1961.
13. Hildebrand, F. B., Introduction to Numerical Analysis, Mc Graw-Hill Book Company, New York, New York, 1956.
14. Manley, R. G., Waveform Analysis, John Wiley and Sons, Inc., London, England, 1945.

FIGURES



FIGURE 1 - HU-1A TEST HELICOPTER.



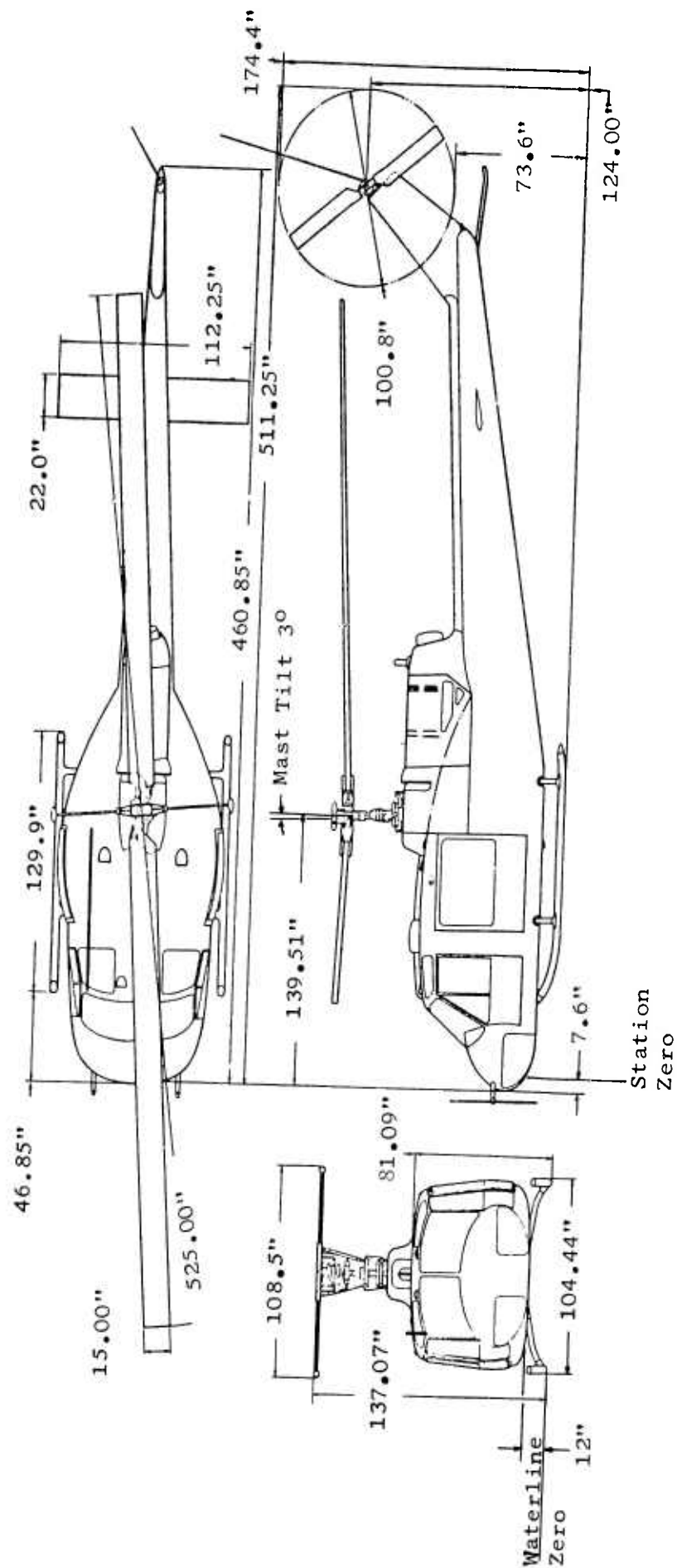


FIGURE 2 - HU-1A HELICOPTER - THREE-VIEW.

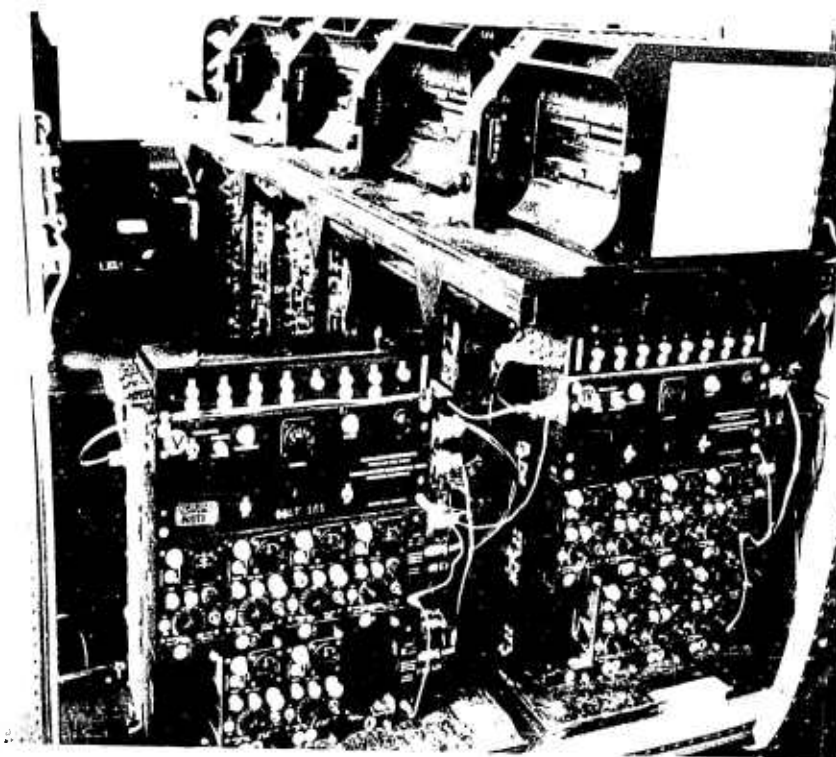


FIGURE 3 - INSTRUMENTATION EQUIPMENT  
IN TEST HELICOPTER.

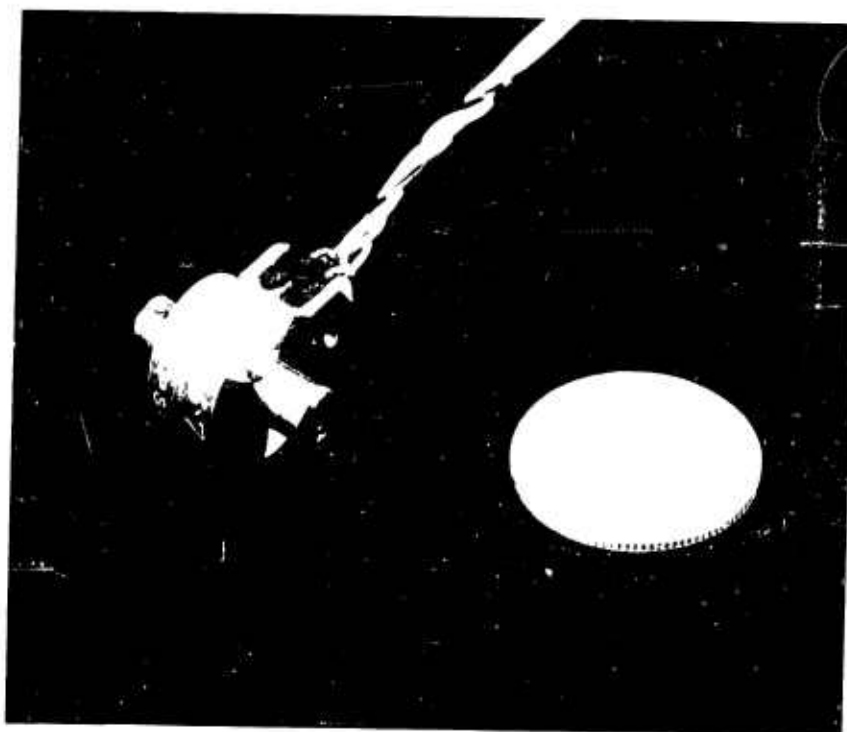


FIGURE 4 - NACA PRESSURE TRANSDUCER  
(SIZE COMPARISON WITH DIME).

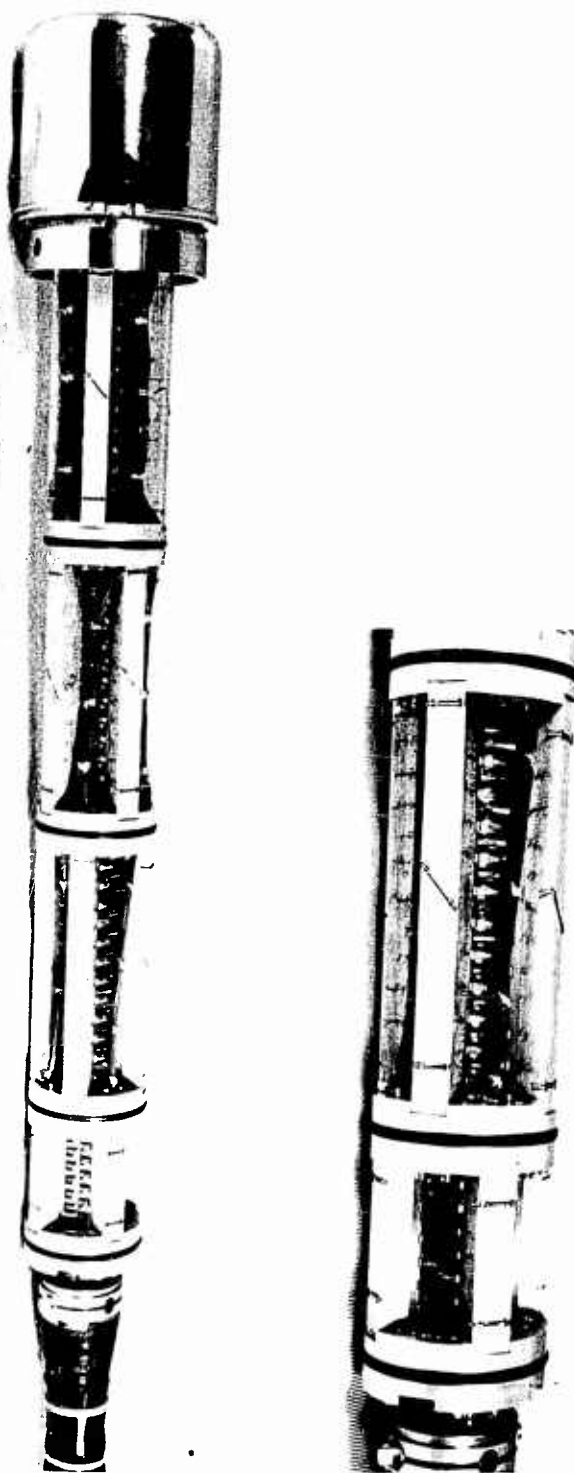


FIGURE 5 - SLIP RING ASSEMBLY.

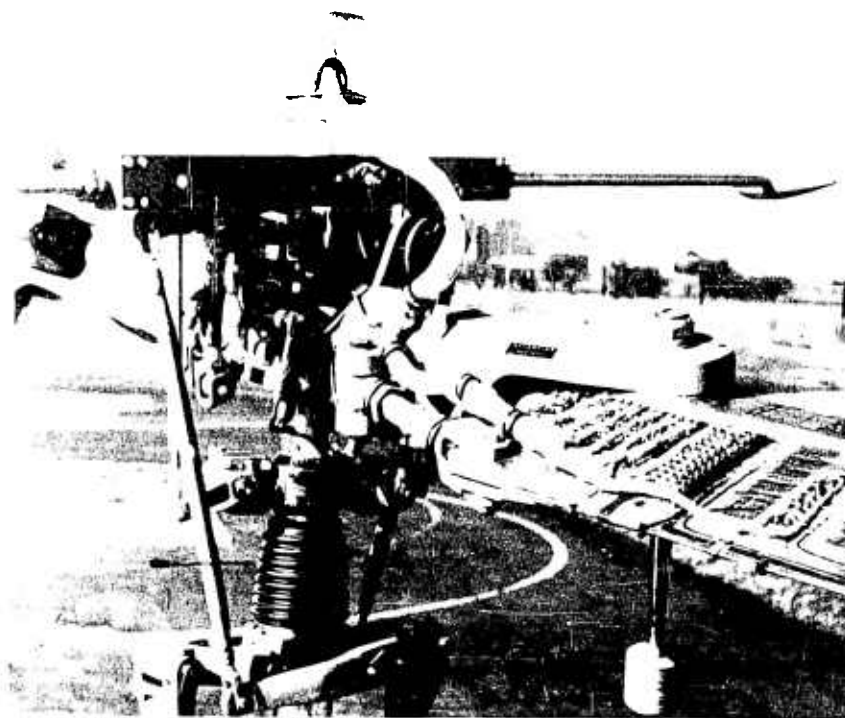
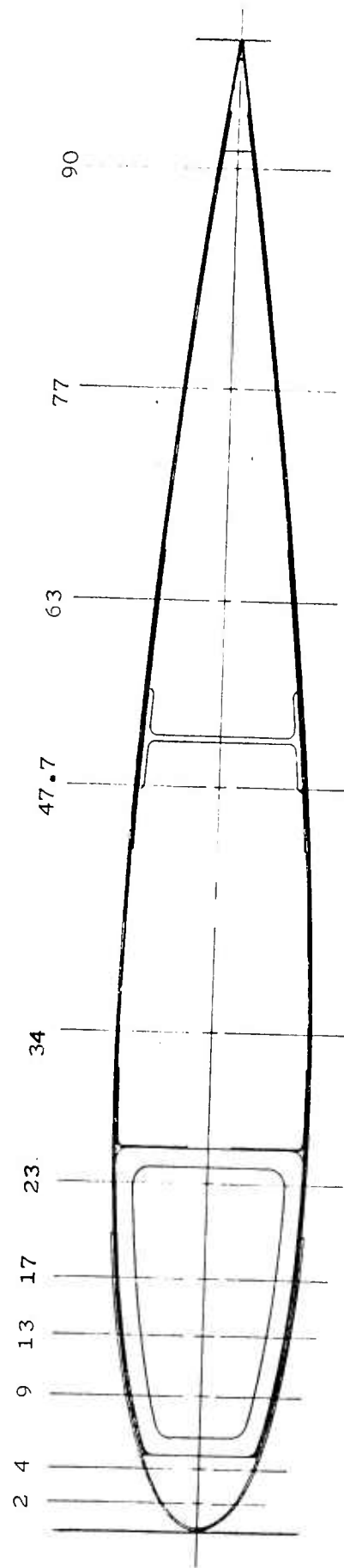


FIGURE 6 - TEST HELICOPTER SLIP RING AND WIRING.

Chord Stations in Per Cent Chord, 85 Per Cent Radius Station Shown



Span Stations in Per Cent Radius

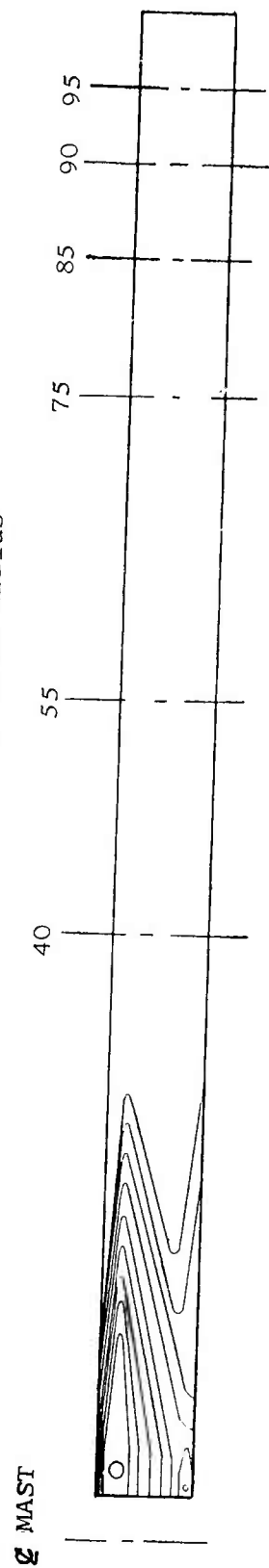


FIGURE 7 - SCHEMATIC LOCATION OF PRESSURE TRANSDUCERS.

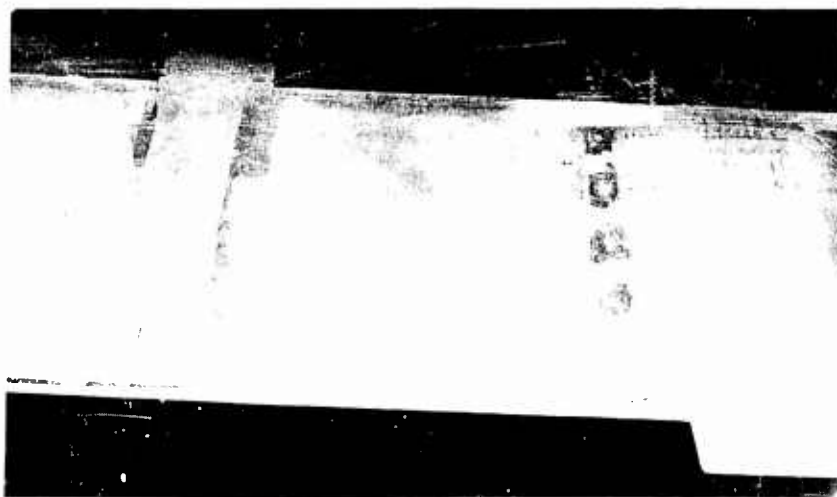
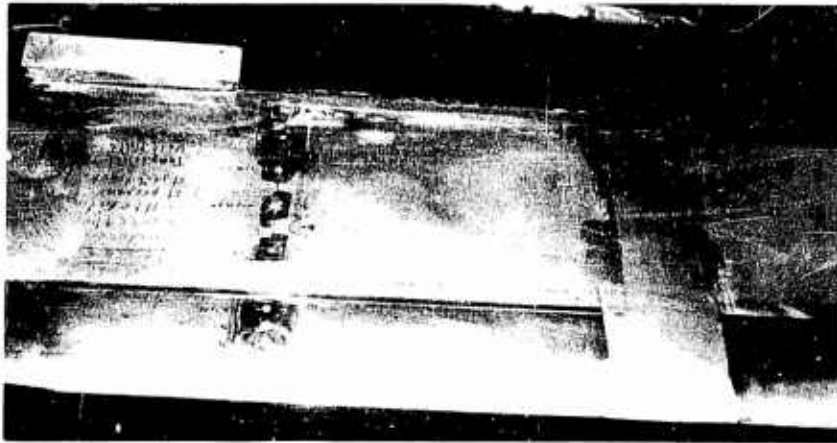


FIGURE 8 - INSTRUMENTED BLADE.

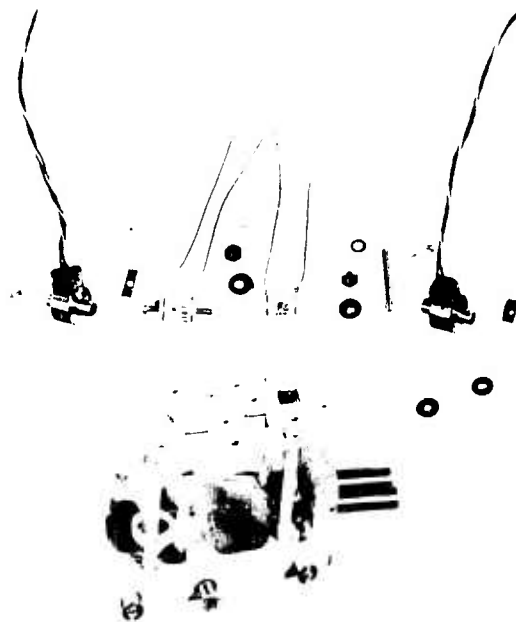


FIGURE 9 -  
TRANSDUCER TRAY ASSEMBLY.

FIGURE 10 -  
TYPES OF  
TRANSDUCER TRAYS.

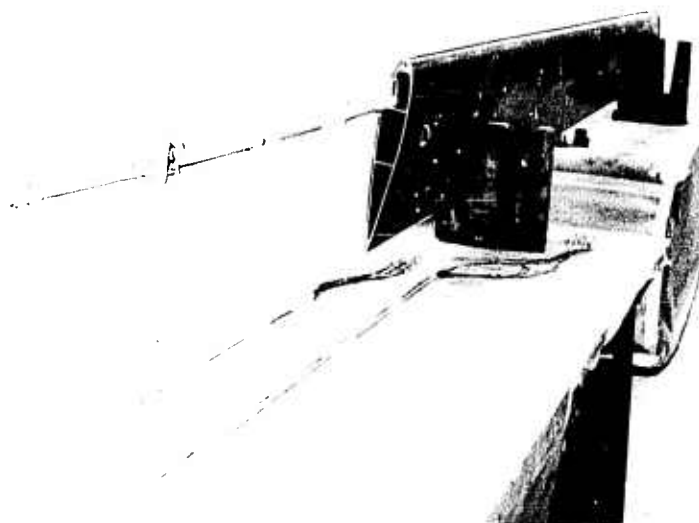


FIGURE 11 -  
TRAY ASSEMBLIES  
BEING INSTALLED  
IN BLADE.

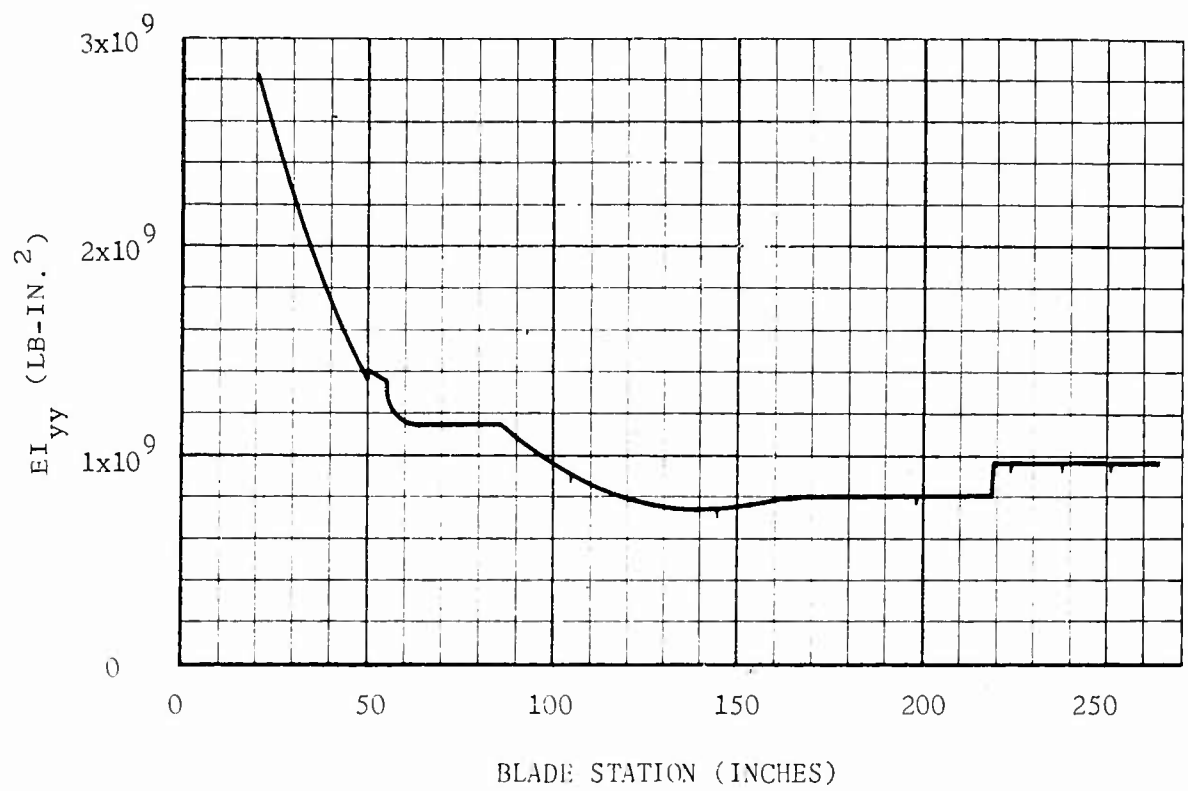


FIGURE 12 - CHORDWISE STIFFNESS DISTRIBUTION.

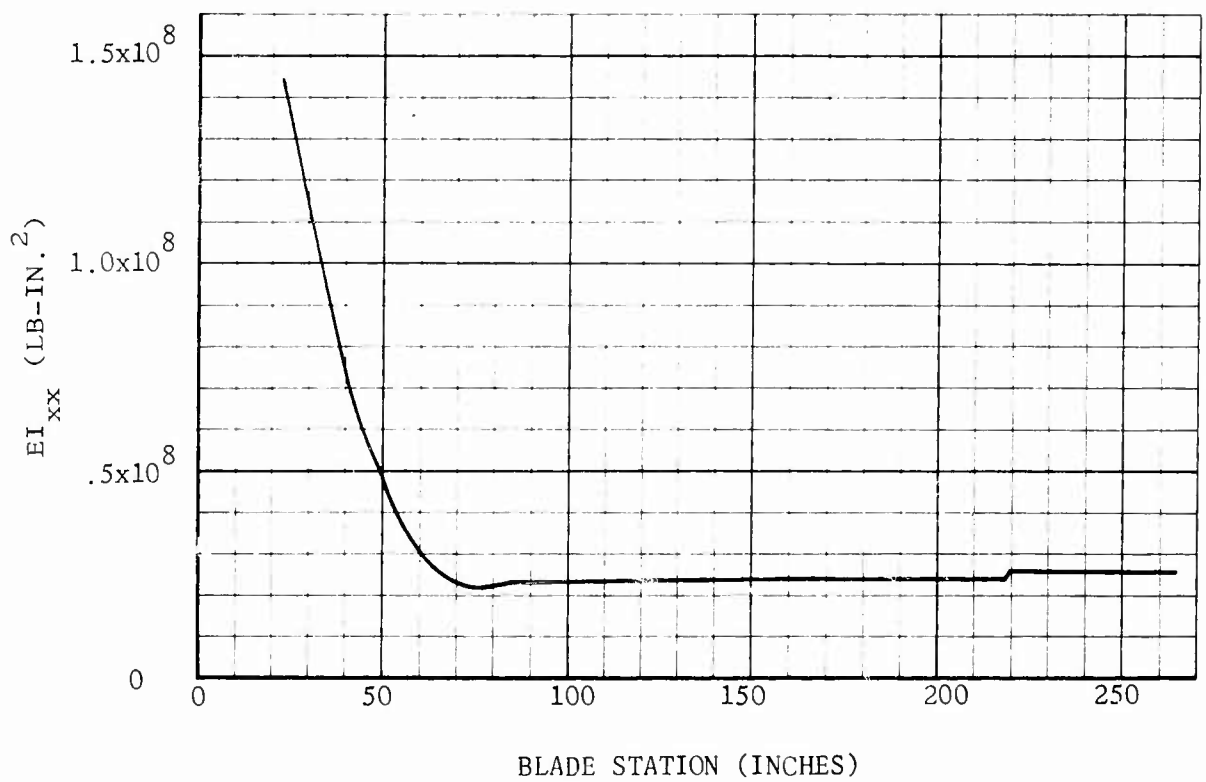


FIGURE 13 - BEAMWISE STIFFNESS DISTRIBUTION.



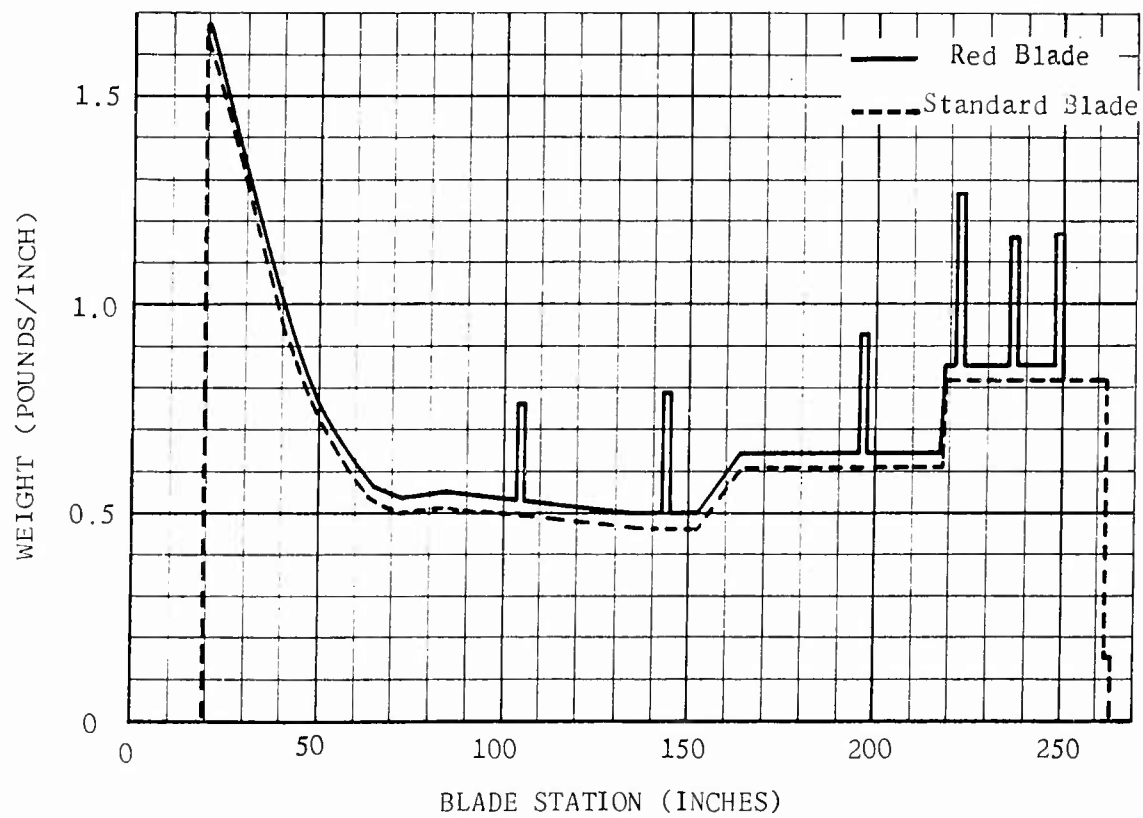


FIGURE 14 - BLADE WEIGHT DISTRIBUTION.

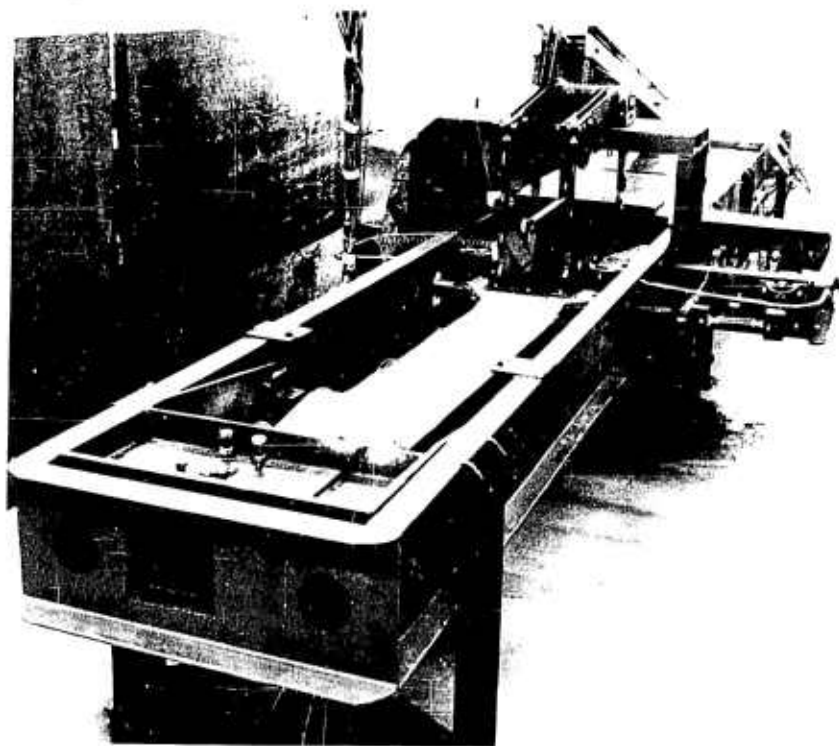


FIGURE 15 - FATIGUE TEST MACHINE.

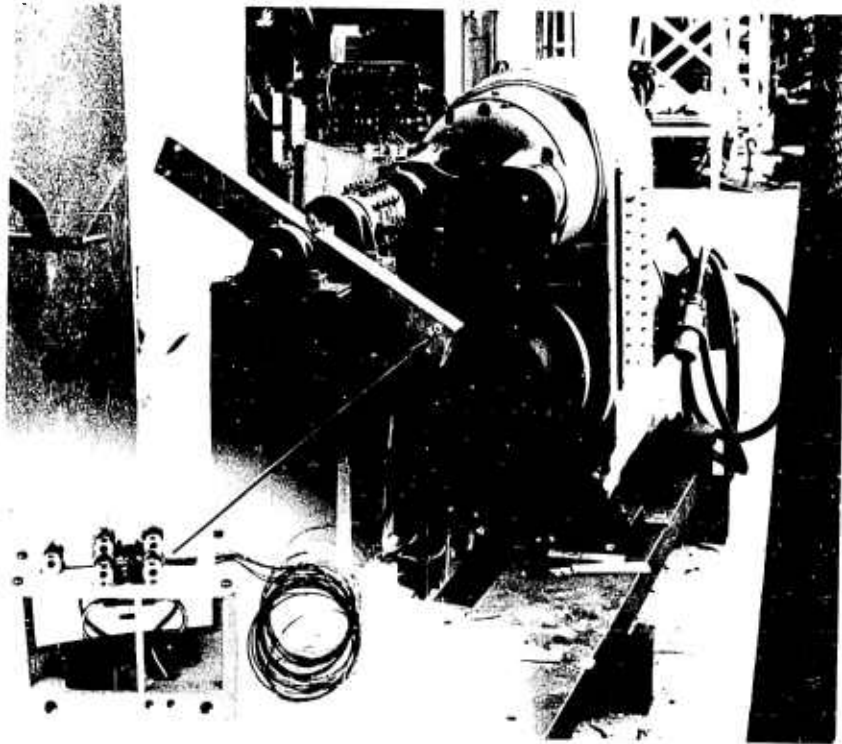


FIGURE 16 - LABORATORY CENTRIFUGE FIXTURE  
AND INSERT SHOWING TRANSDUCER  
TRAY ASSEMBLY.

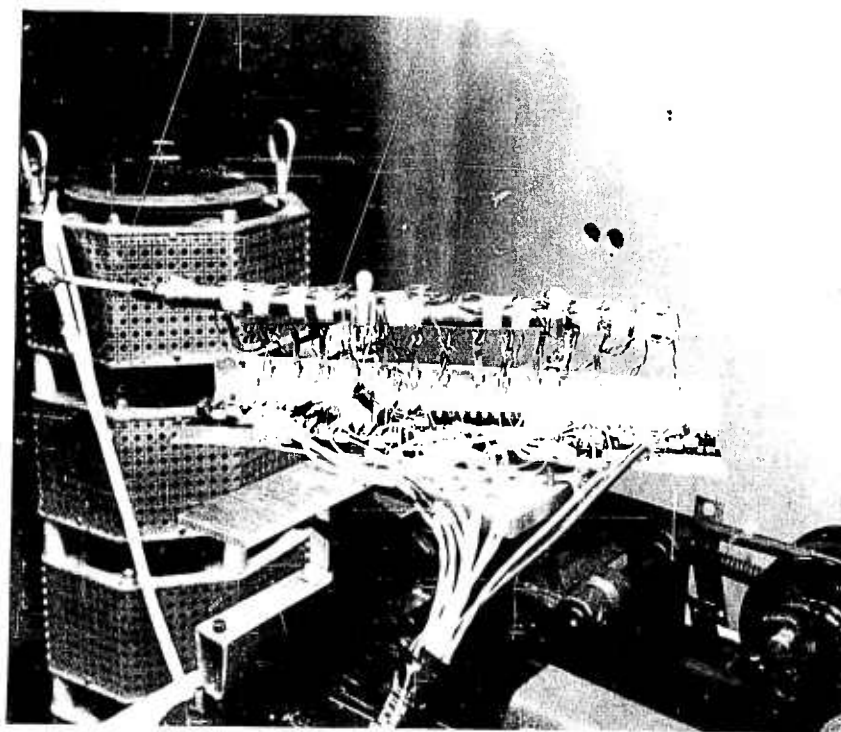


FIGURE 17 - PRESSURE TRANSDUCER TEST FIXTURE.

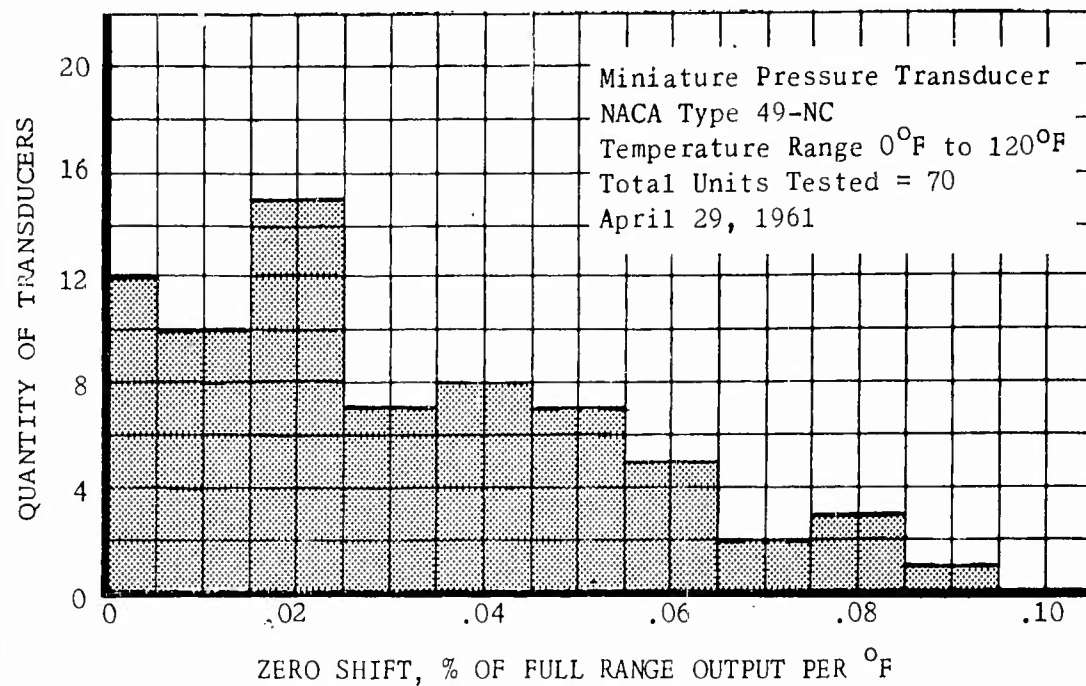


FIGURE 18 - ZERO SHIFT DUE TO TEMPERATURE CHANGE.

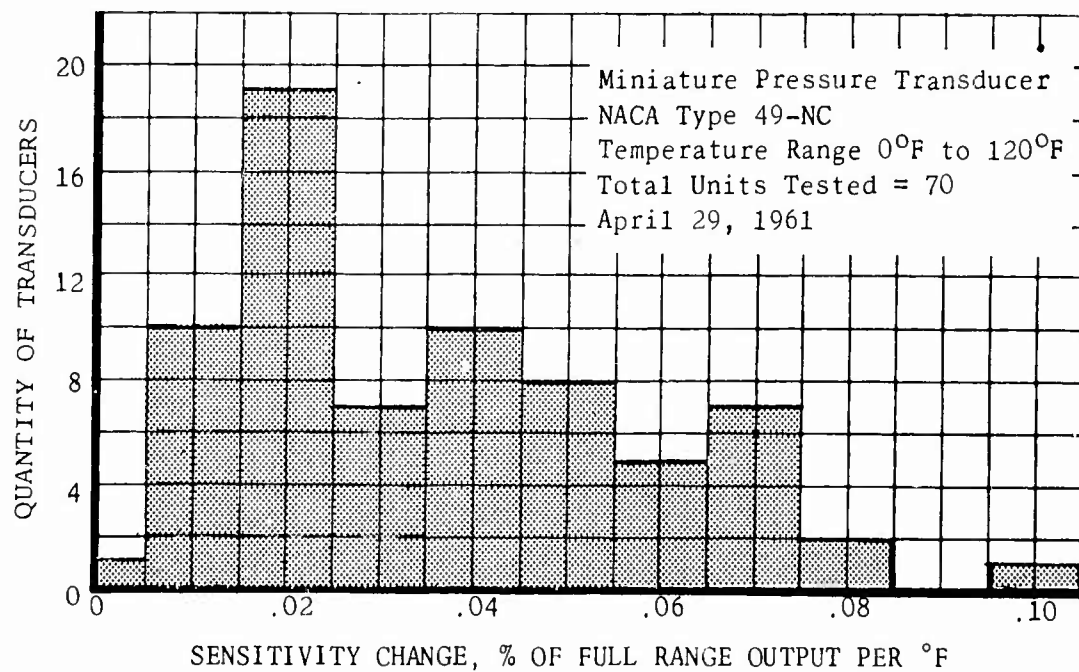


FIGURE 19 - SENSITIVITY CHANGE DUE TO TEMPERATURE CHANGE.

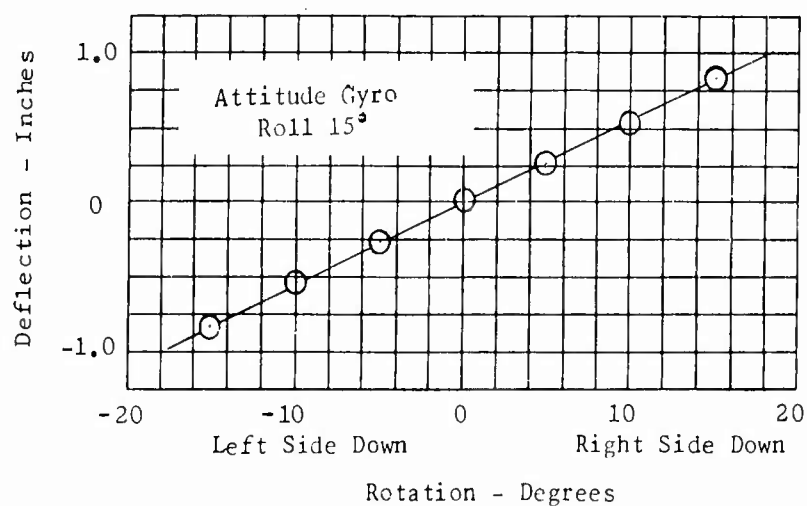


FIGURE 20a -  
Roll Attitude  
Gyro Calibration  
Curve.

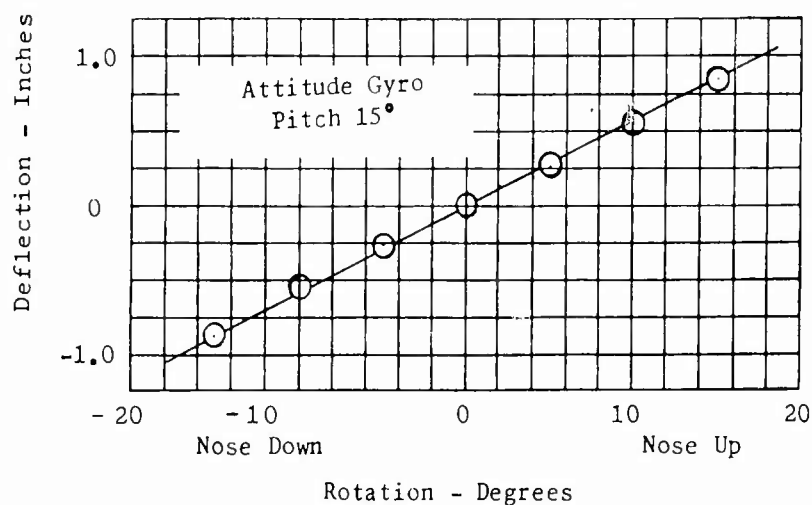


FIGURE 20b -  
Pitch Attitude  
Gyro Calibration  
Curve.

FIGURE 20 - ATTITUDE GYRO CALIBRATION CURVES.

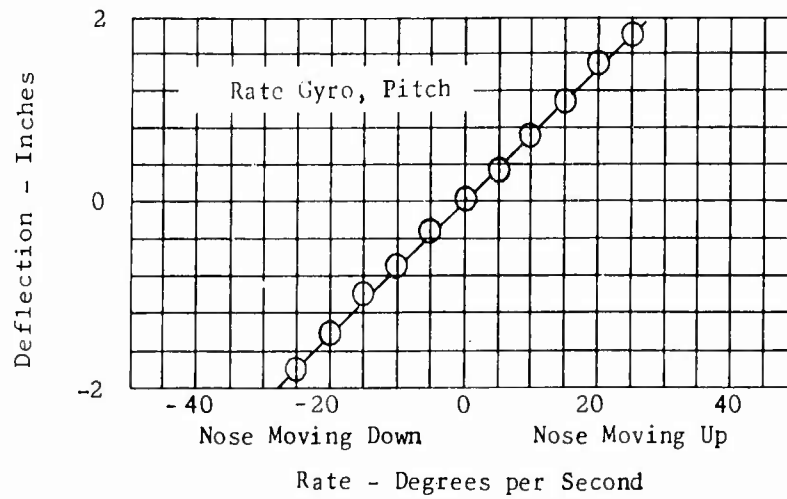


FIGURE 21a -  
Pitch Rate Gyro  
Calibration  
Curve.

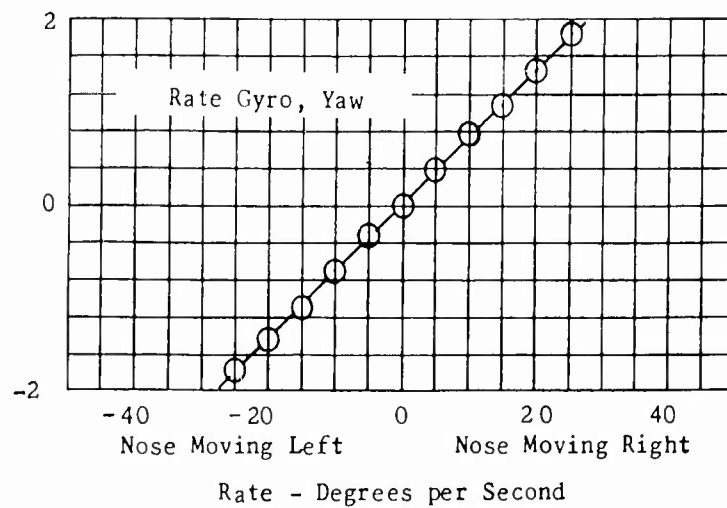


FIGURE 21b -  
Yaw Rate Gyro  
Calibration  
Curve.

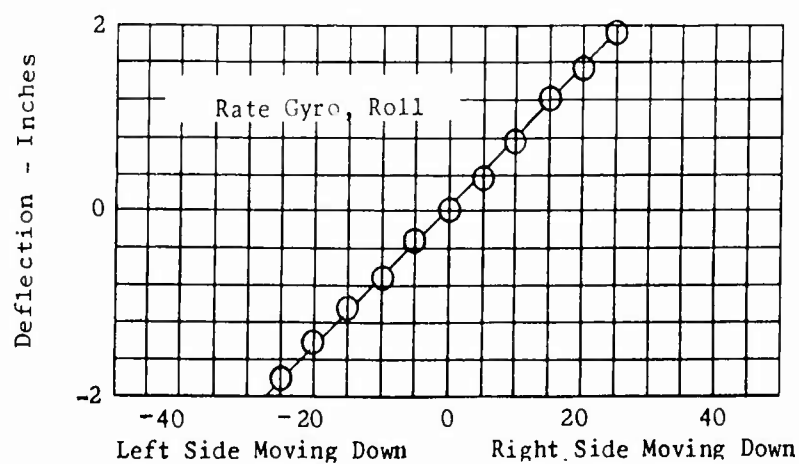


FIGURE 21c -  
Roll Rate Gyro  
Calibration  
Curve.

FIGURE 21 - RATE GYROS CALIBRATION CURVES.

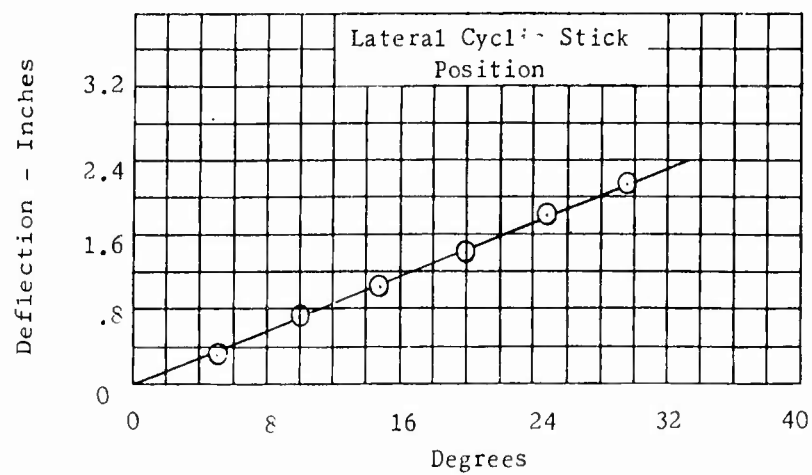


FIGURE 22a -  
Lateral Cyclic  
Stick Position.

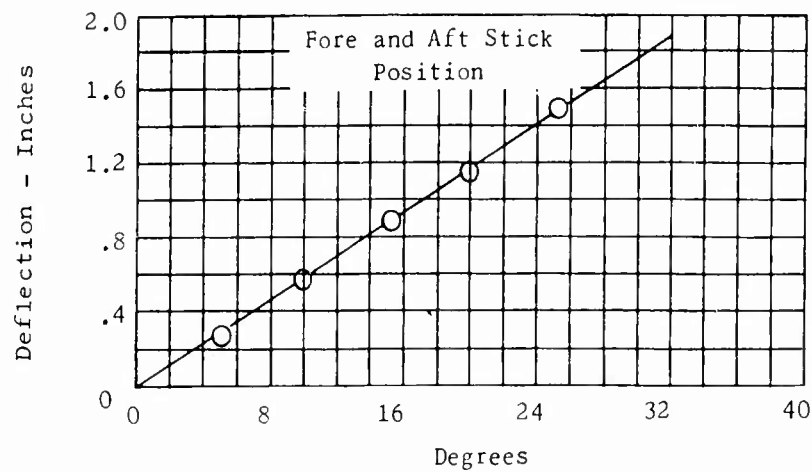


FIGURE 22b - Fore  
and Aft Cyclic  
Stick Position.

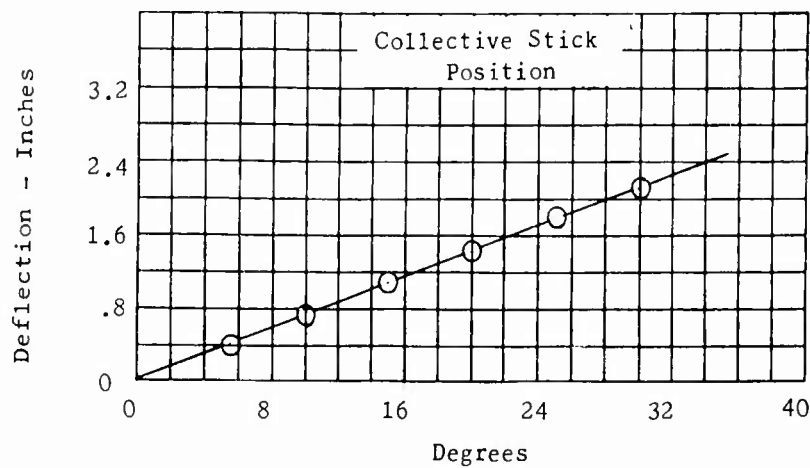


FIGURE 22c -  
Collective Stick  
Position.

FIGURE 22 - POSITION INDICATORS CALIBRATION CURVES.

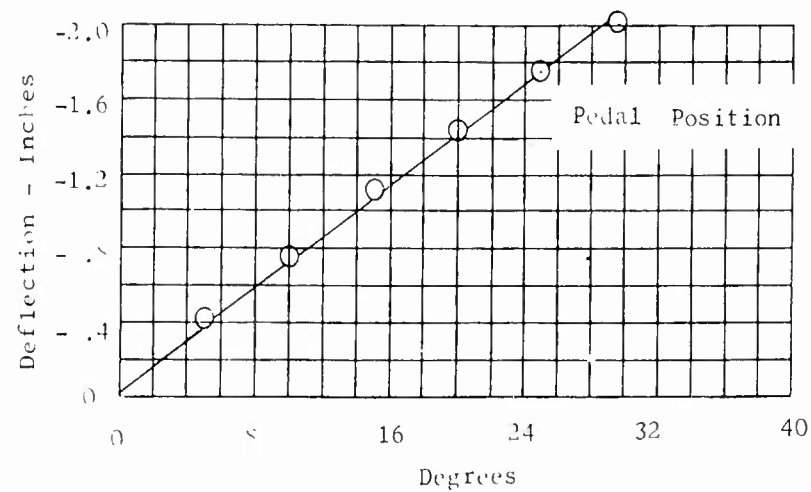


FIGURE 22d -  
Rudder Pedal  
Position  
Indicator.

FIGURE 22 - POSITION INDICATORS CALIBRATION CURVES .



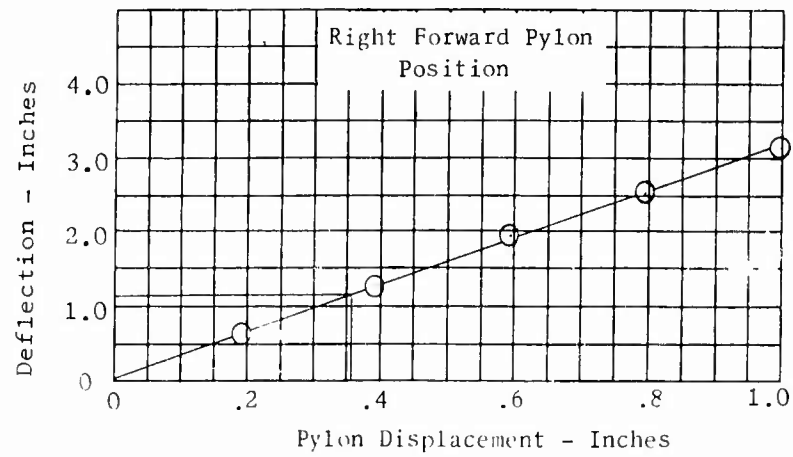


FIGURE 22e -  
Pylon Position  
Indicator.

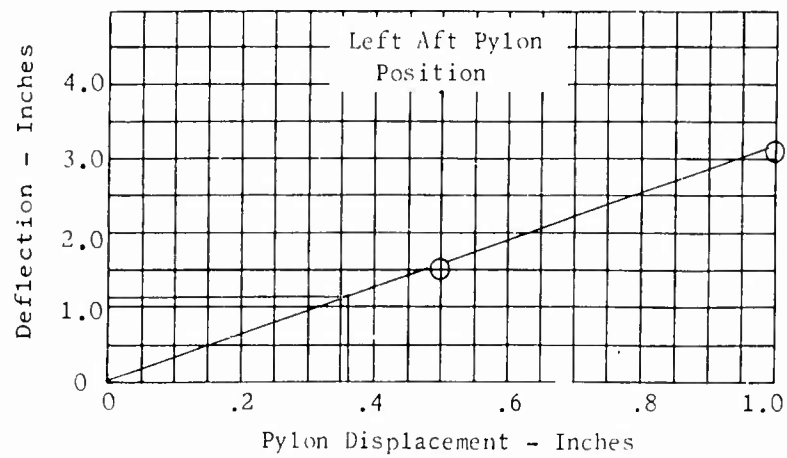


FIGURE 22f -  
Pylon Position  
Indicator.

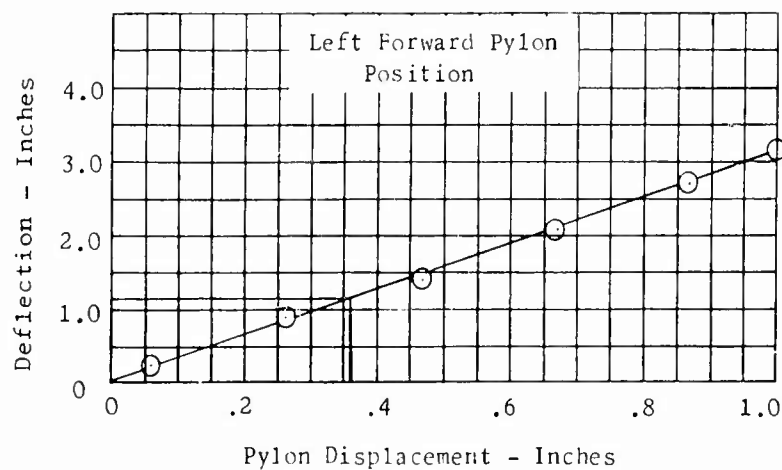


FIGURE 22g -  
Pylon Position  
Indicator.

FIGURE 22 - POSITION INDICATORS CALIBRATION CURVES .

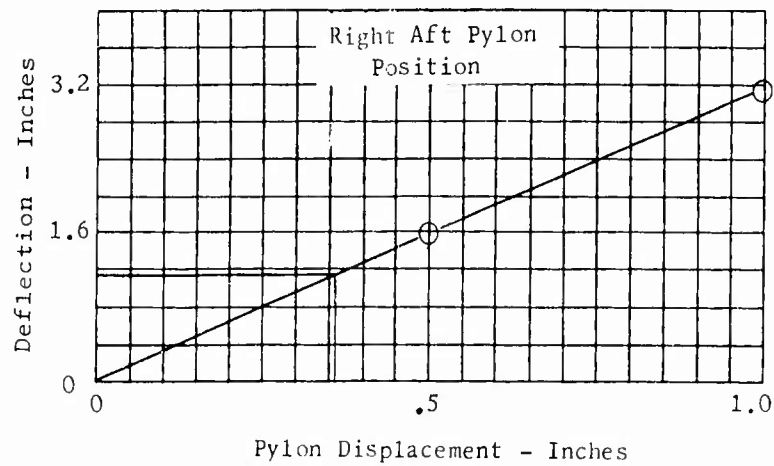


FIGURE 22h -  
Pylon Position  
Indicator.

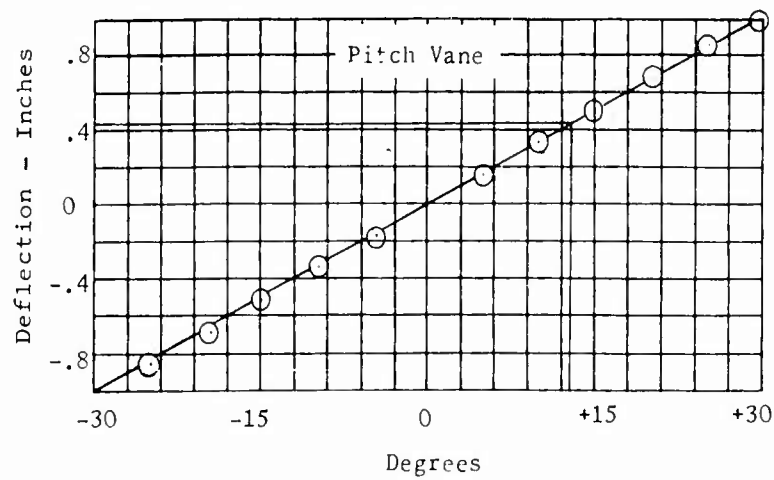


FIGURE 22i -  
Pitch Vane  
Position  
Indicator

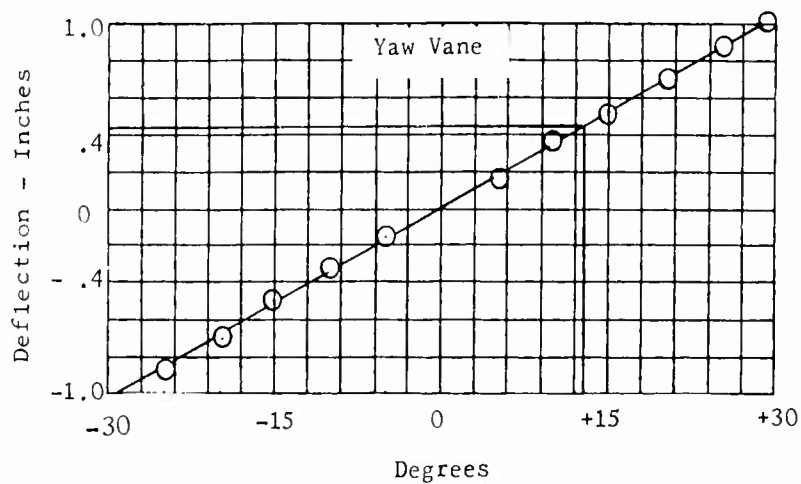


FIGURE 22j -  
Yaw Vane Position  
Indicator.

FIGURE 22 - POSITION INDICATORS CALIBRATION CURVES .

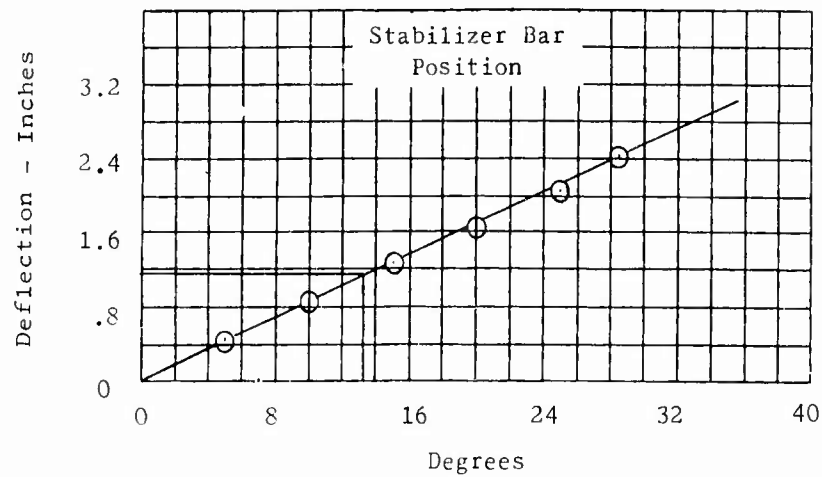


FIGURE 22k -  
Stabilizer Bar  
Position  
Indicator.

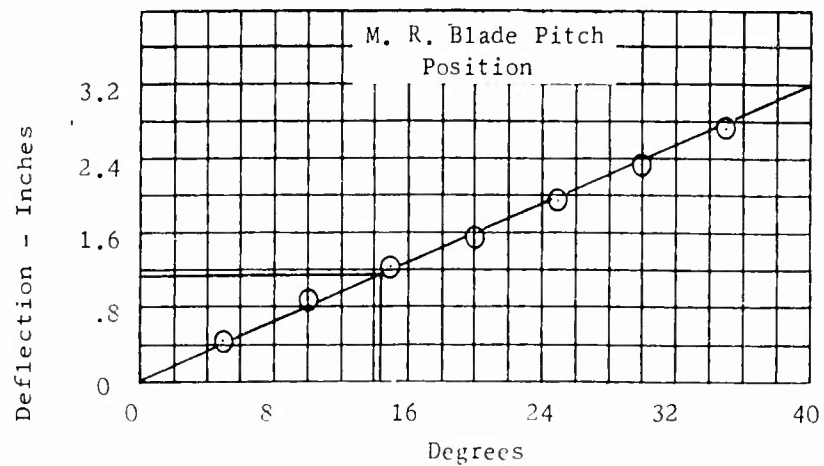


FIGURE 22l -  
Main Rotor Blade  
Pitch Position  
Indicator.

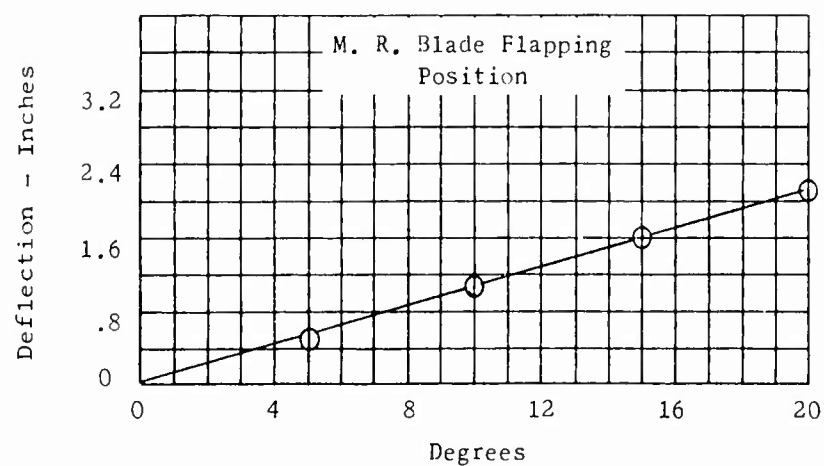


FIGURE 22m -  
Main Rotor Blade  
Flapping Position  
Indicator

FIGURE 22 - POSITION INDICATORS CALIBRATION CURVES.

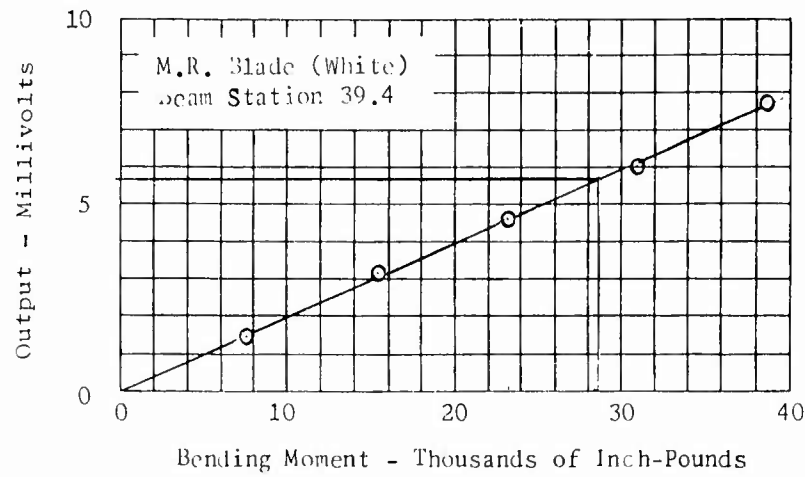


FIGURE 23a -  
White Blade Beam  
Bending.

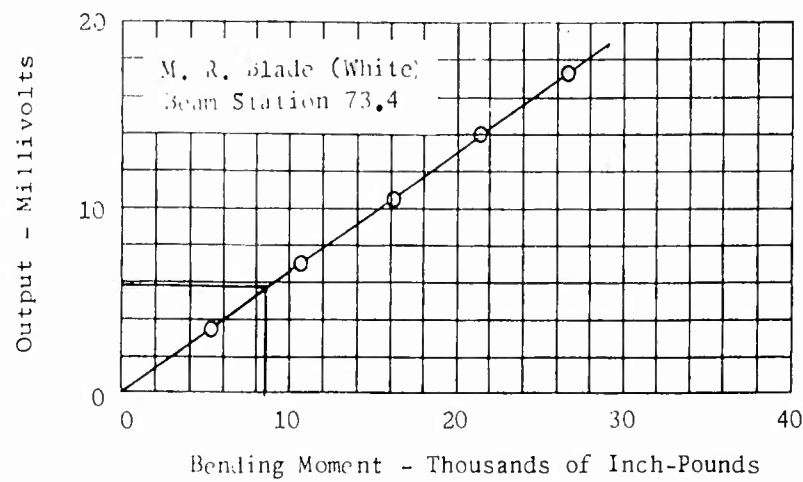


FIGURE 23b -  
White Blade  
Beam Bending

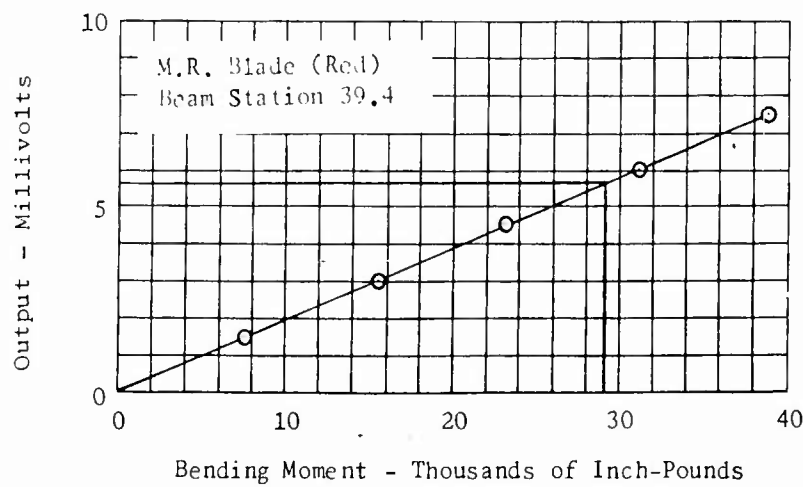


FIGURE 23c -  
Red Blade  
Beam Bending.

FIGURE 23 - MAIN ROTOR BLADE STRAIN GAGE CALIBRATION CURVES

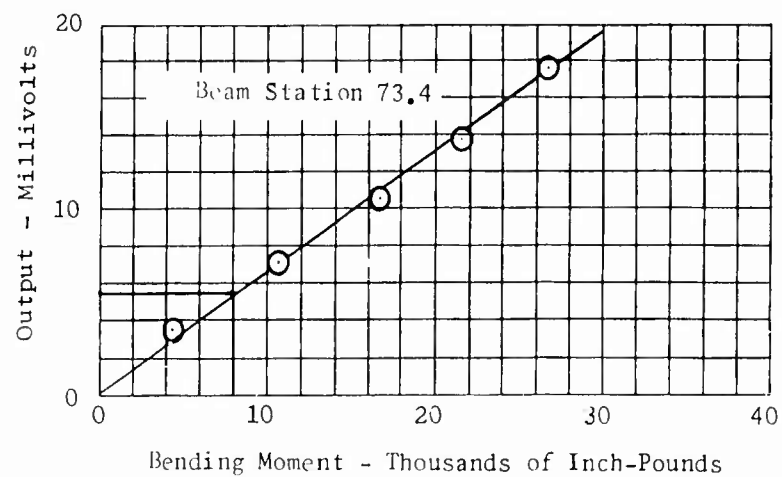


FIGURE 23d -  
Red Blade  
Beam Bending

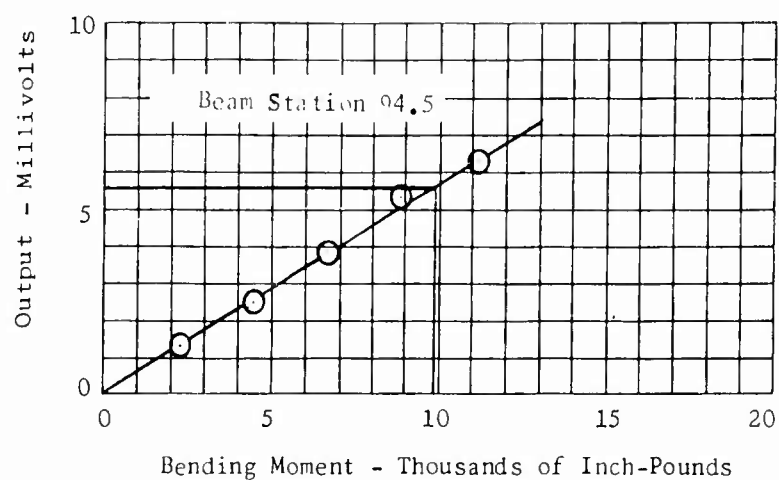


FIGURE 23e -  
Red Blade  
Beam Bending

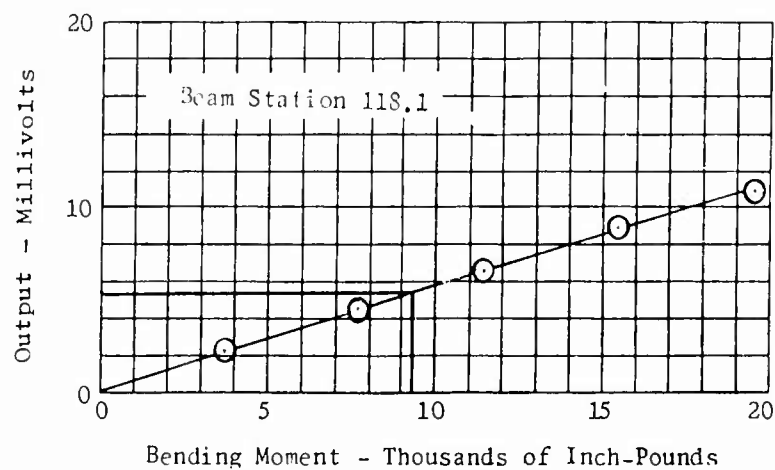


FIGURE 23f -  
Red Blade  
Beam Bending

FIGURE 23 - MAIN ROTOR BLADE STRAIN GAGE CALIBRATION CURVES

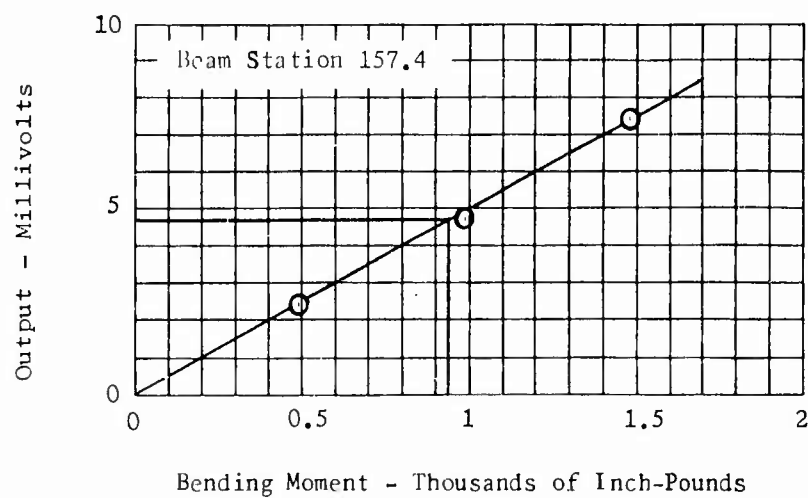


FIGURE 23g -  
Red Blade  
Beam Bending.

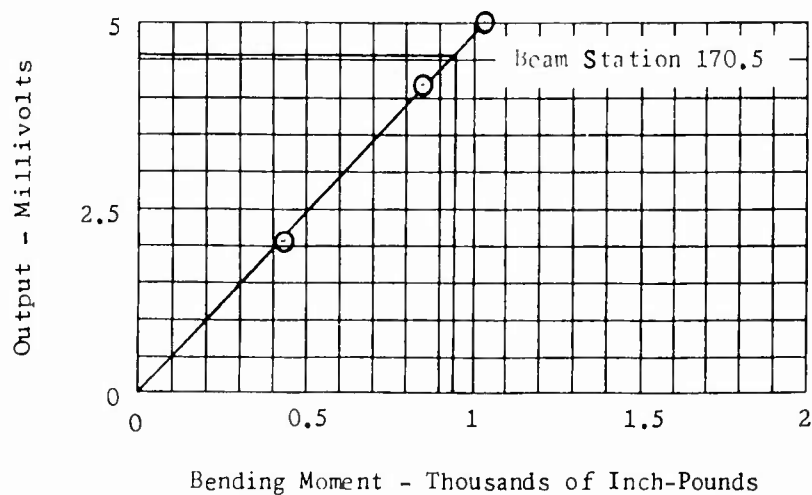


FIGURE 23h -  
Red Blade  
Beam Bending.

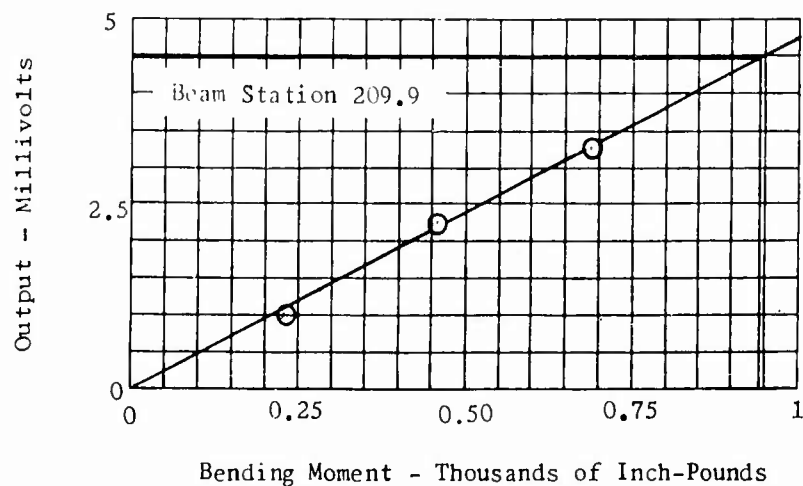


FIGURE 23i -  
Red Blade  
Beam Bending

FIGURE 23 - MAIN ROTOR BLADE STRAIN GAGE CALIBRATION CURVES .

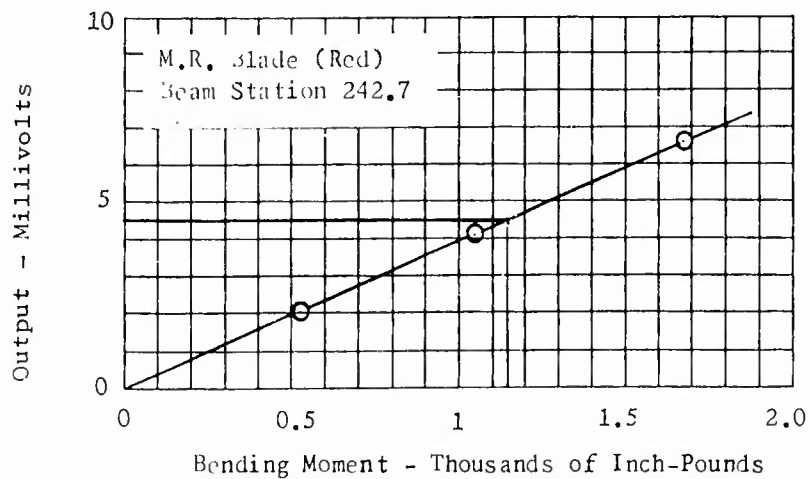


FIGURE 23j -  
Red Blade  
Beam Bending.

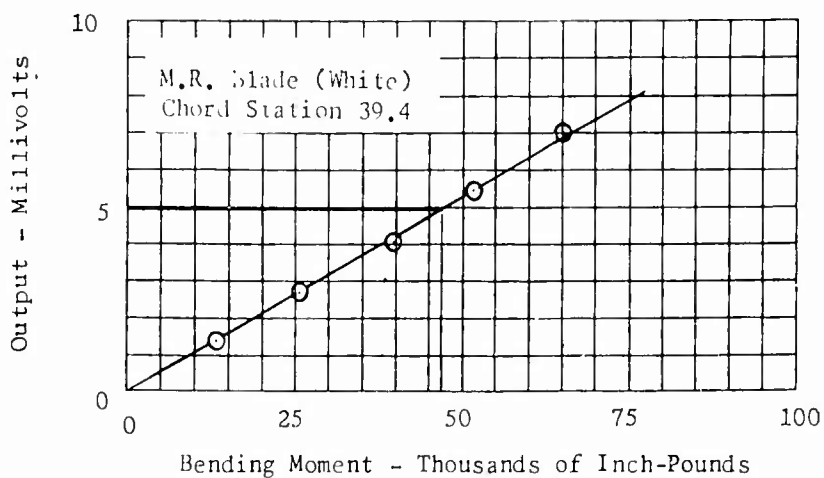


FIGURE 23k -  
White Blade  
Chord Bending.

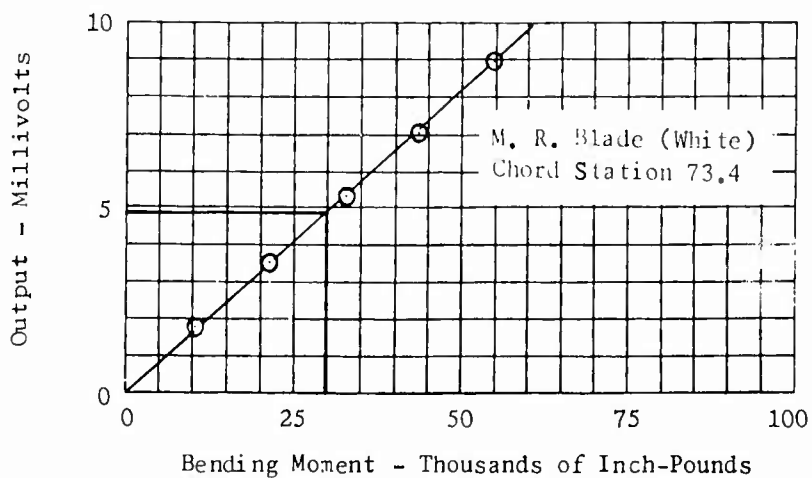


FIGURE 23l -  
White Blade  
Chord Bending.

FIGURE 23 - MAIN ROTOR BLADE STRAIN GAGE CALIBRATION CURVES.

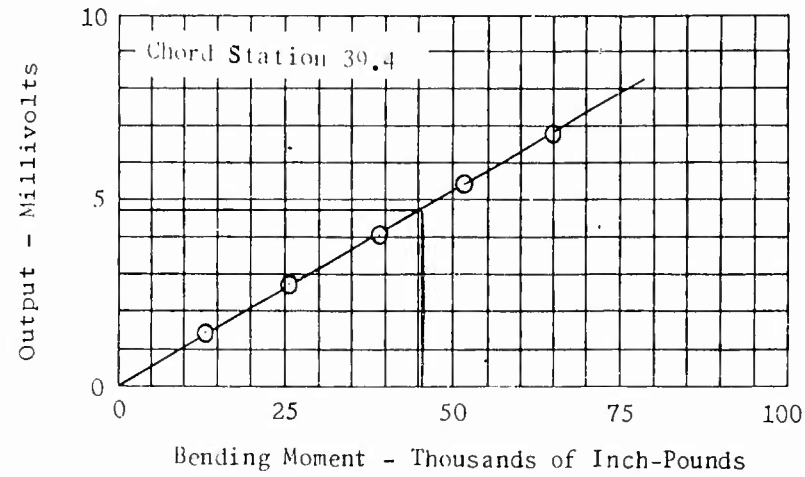


FIGURE 23m -  
Red Blade  
Chord Bending.

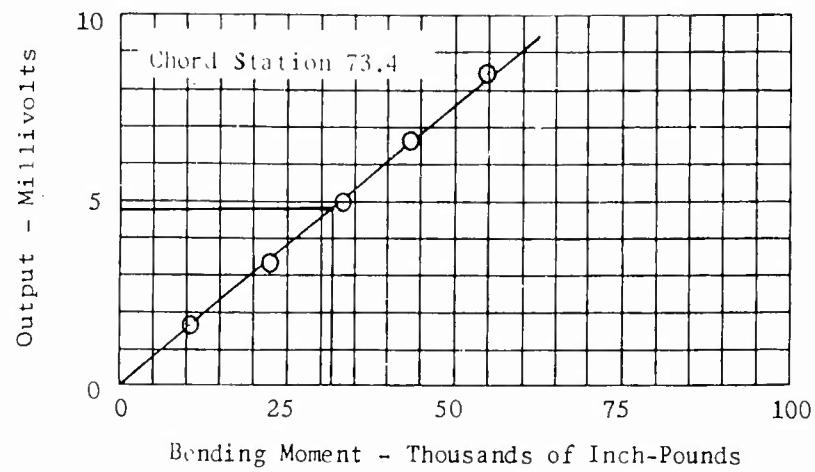


FIGURE 23n -  
Red Blade  
Chord Bending

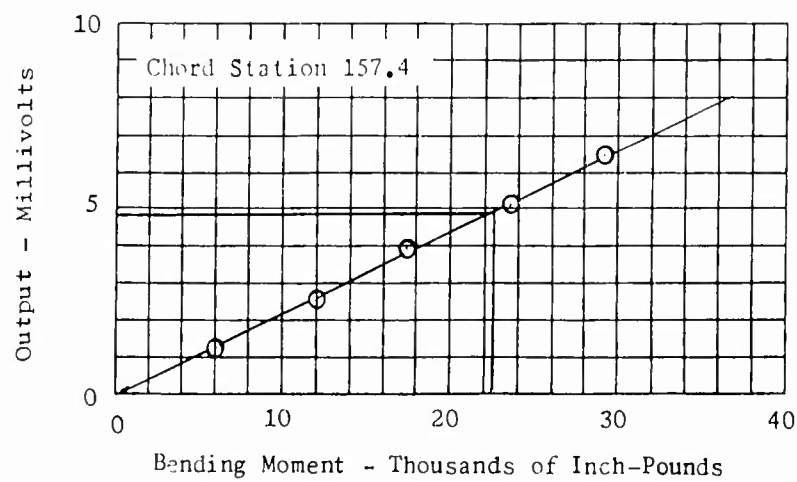


FIGURE 23o -  
Red Blade  
Chord Bending.

FIGURE 23 - MAIN ROTOR BLADE STRAIN GAGE CALIBRATION CURVES.



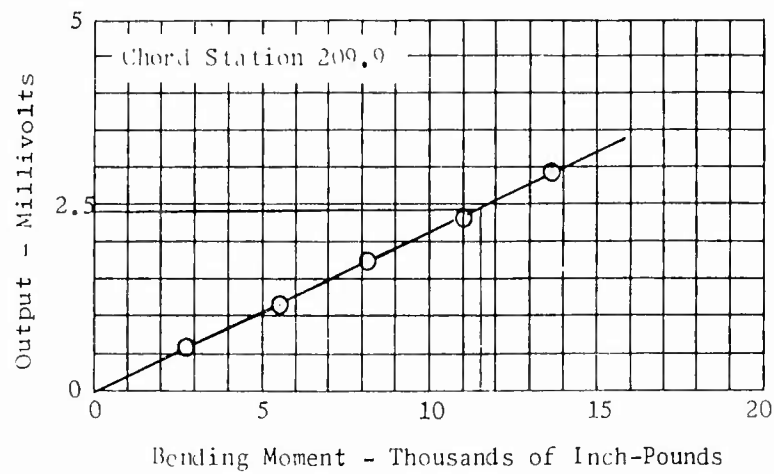


FIGURE 23p -  
Red Blade  
Chord Bending

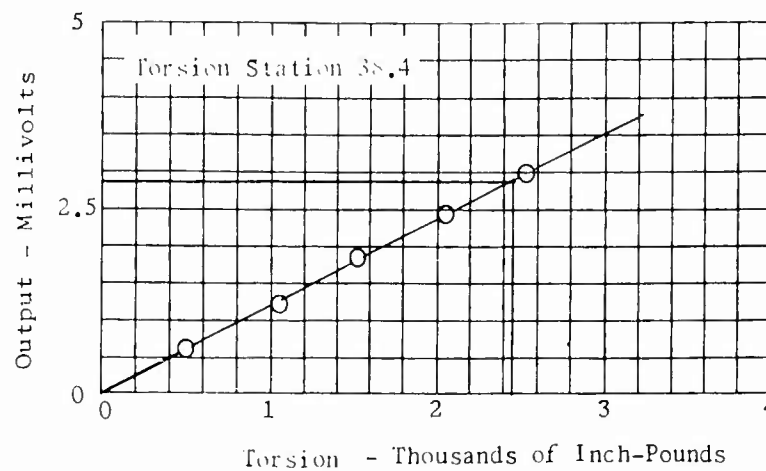


FIGURE 23q -  
Red Blade  
Torsion.

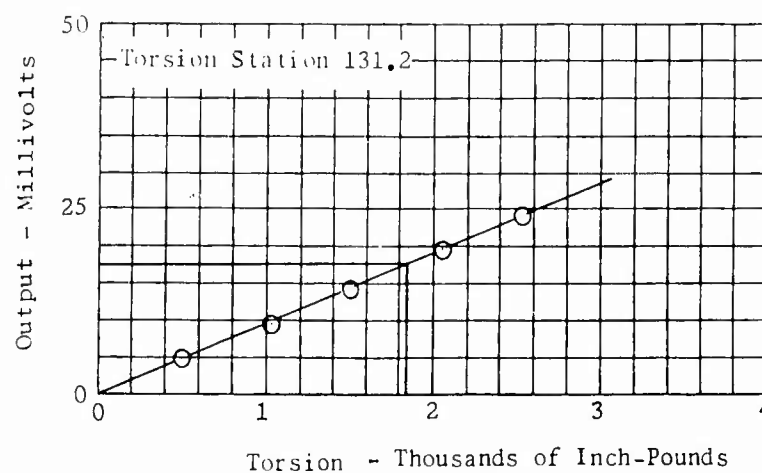


FIGURE 23r -  
Red Blade  
Torsion.

FIGURE 23 - MAIN ROTOR BLADE STRAIN GAGE CALIBRATION CURVES.

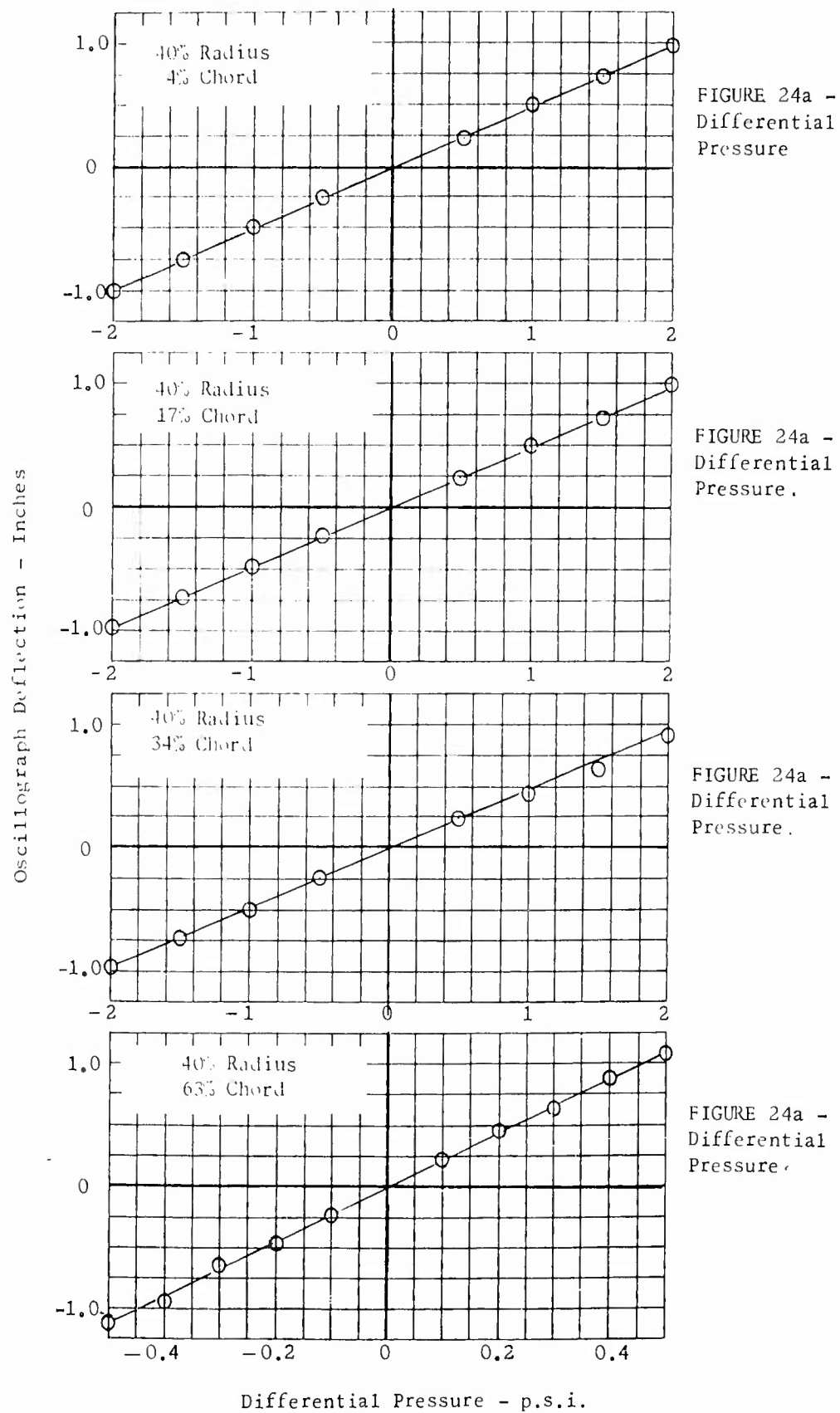


FIGURE 24a -  
Differential  
Pressure

FIGURE 24a -  
Differential  
Pressure.

FIGURE 24a -  
Differential  
Pressure.

FIGURE 24a -  
Differential  
Pressure.

FIGURE 24 - PRESSURE TRANSDUCER CALIBRATION CURVES,

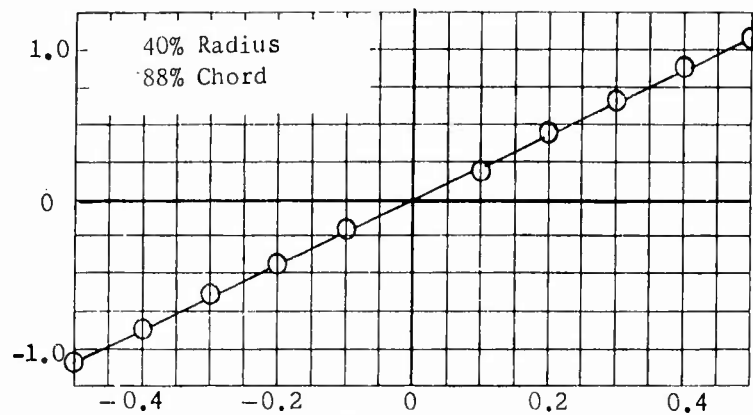


FIGURE 24a -  
Differential  
Pressure.

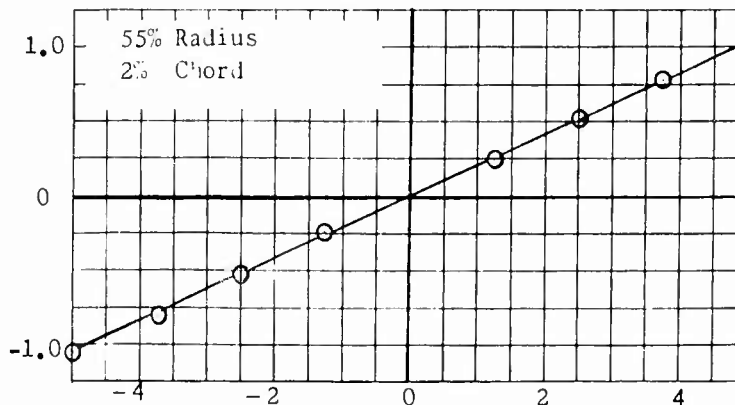


FIGURE 24b -  
Differential  
Pressure

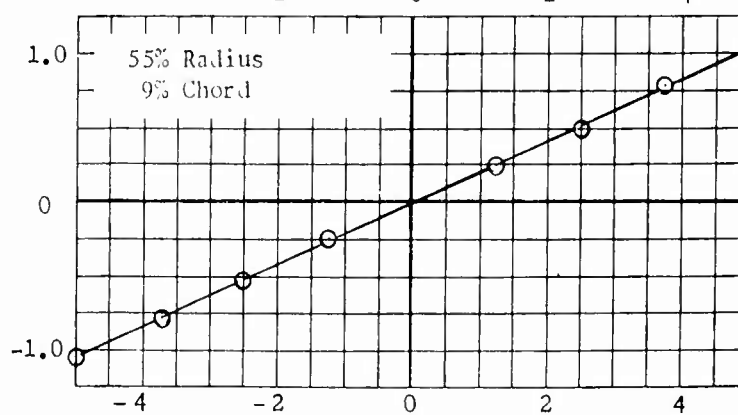


FIGURE 24b -  
Differential  
Pressure.

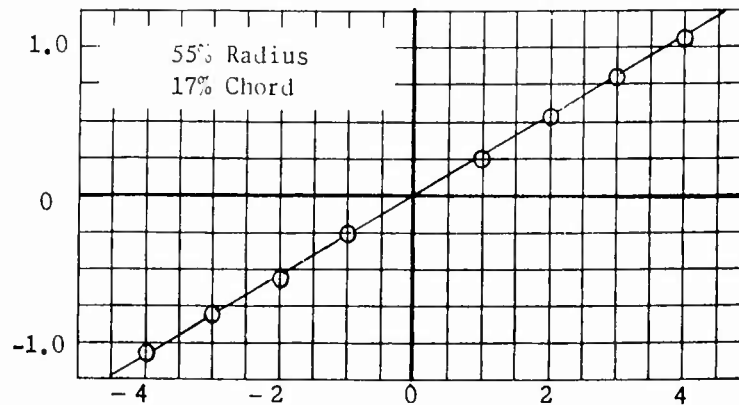


FIGURE 24b -  
Differential  
Pressure.

Differential Pressure - p.s.i.

FIGURE 24 - PRESSURE TRANSDUCER CALIBRATION CURVES.

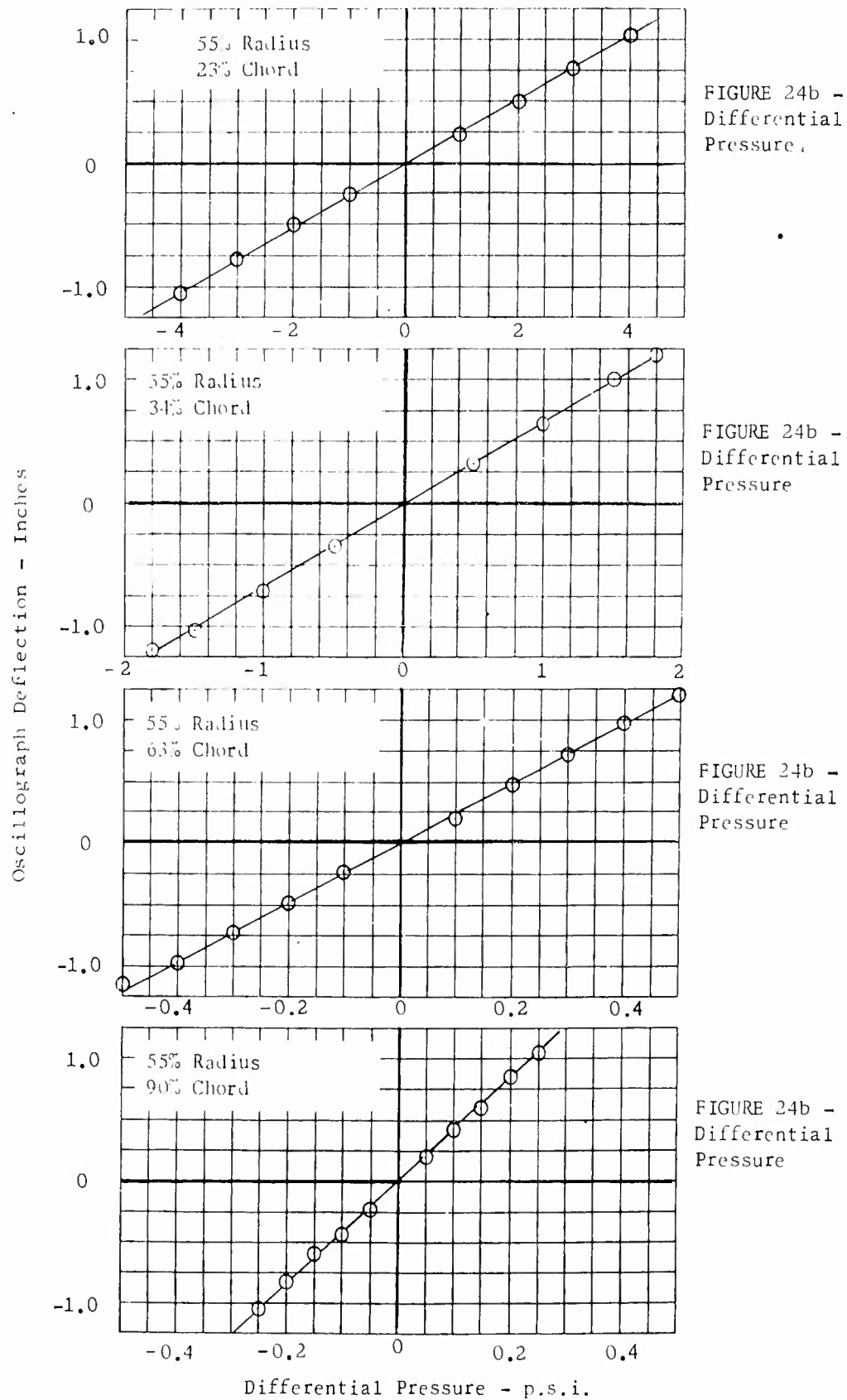


FIGURE 24 - PRESSURE TRANSDUCER CALIBRATION CURVES

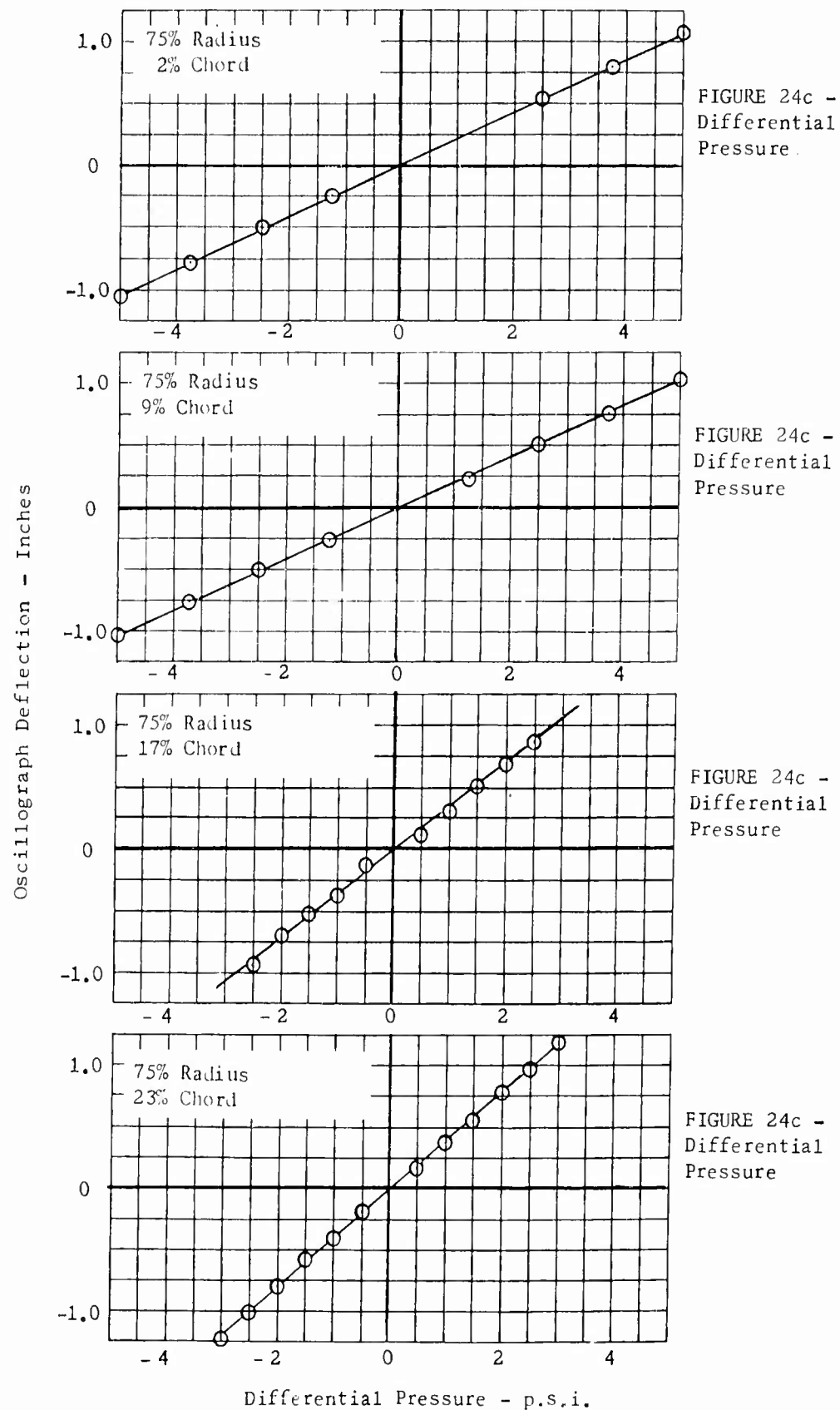


FIGURE 24 - PRESSURE TRANSDUCER CALIBRATION CURVES

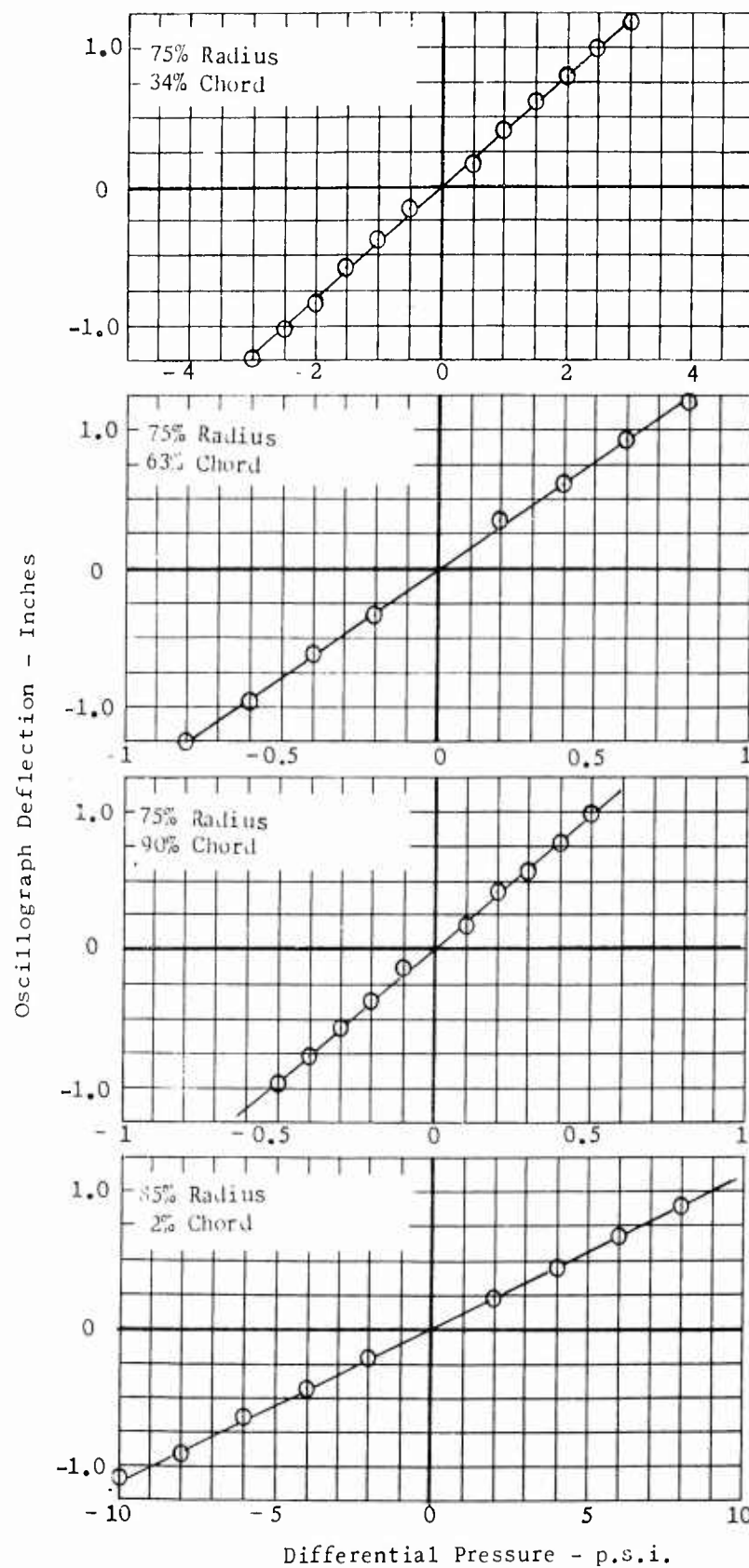


FIGURE 24c -  
Differential  
Pressure .

FIGURE 24c -  
Differential  
Pressure

FIGURE 24c -  
Differential  
Pressure

FIGURE 24d -  
Differential  
Pressure .

FIGURE 24 - PRESSURE TRANSDUCER CALIBRATION CURVES .

Oscillograph Deflection - Inches

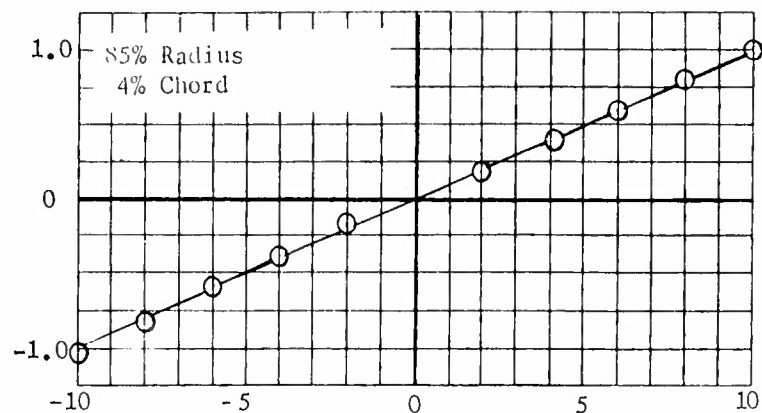


FIGURE 24d -  
Differential  
Pressure.

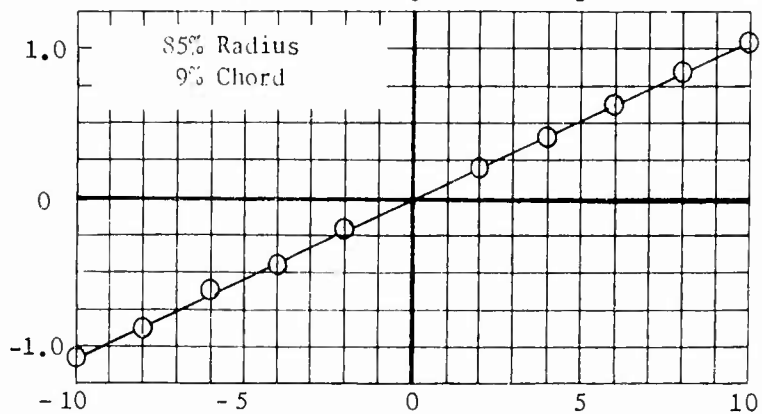


FIGURE 24d -  
Differential  
Pressure

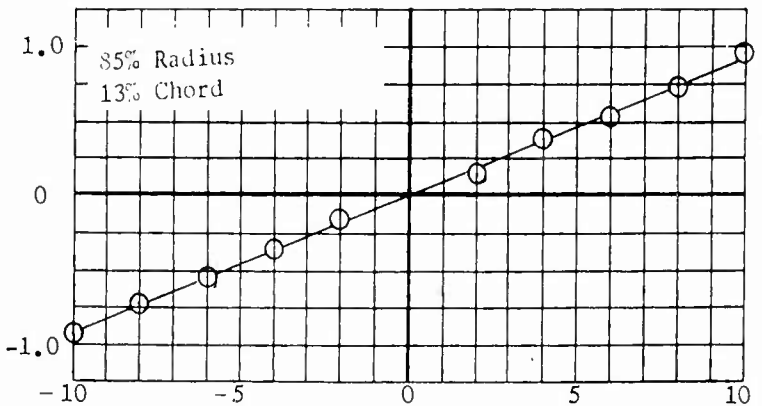


FIGURE 24d -  
Differential  
Pressure.

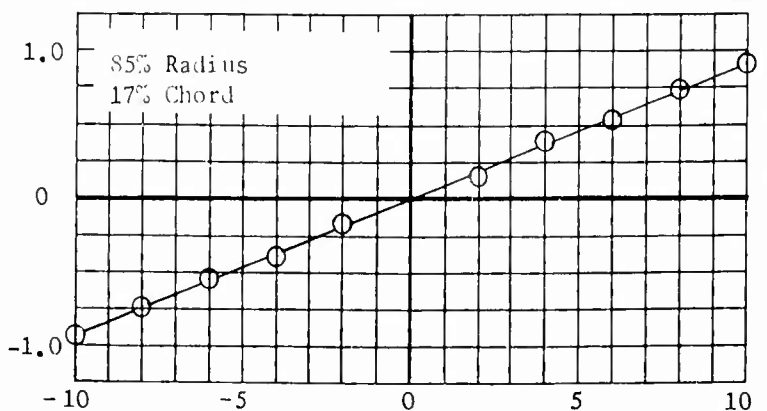


FIGURE 24d -  
Differential  
Pressure.

Differential Pressure - p.s.i.,

FIGURE 24 - PRESSURE TRANSDUCER CALIBRATION CURVES.

Oscillograph Deflection - Inches

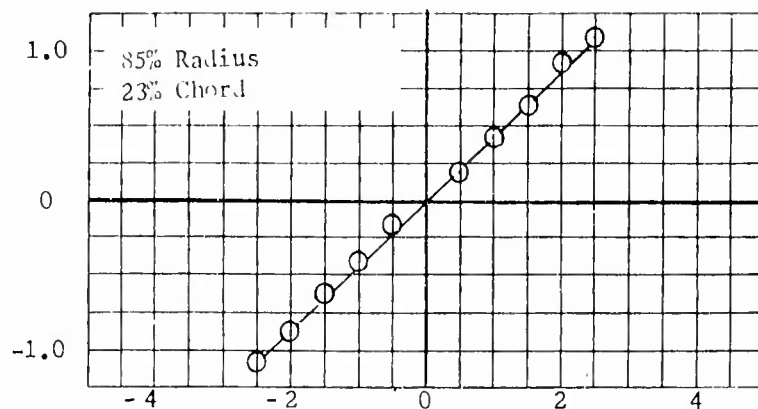


FIGURE 24d -  
Differential  
Pressure.

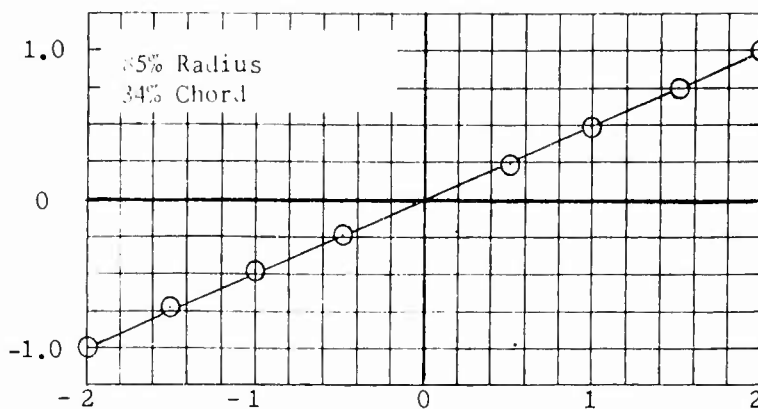


FIGURE 24d -  
Differential  
Pressure.

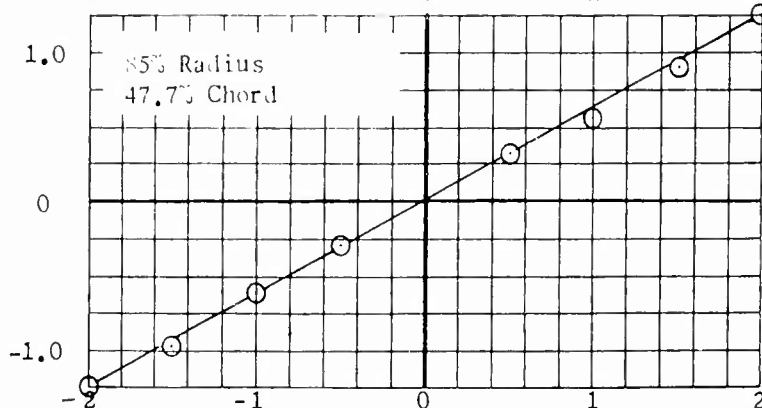


FIGURE 24d -  
Differential  
Pressure.

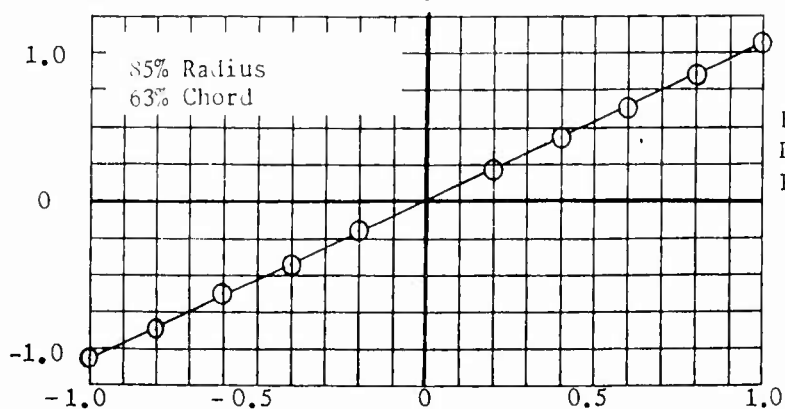


FIGURE 24d -  
Differential  
Pressure

Differential Pressure - p.s.i.

FIGURE 24 - PRESSURE TRANSDUCER CALIBRATION CURVES.



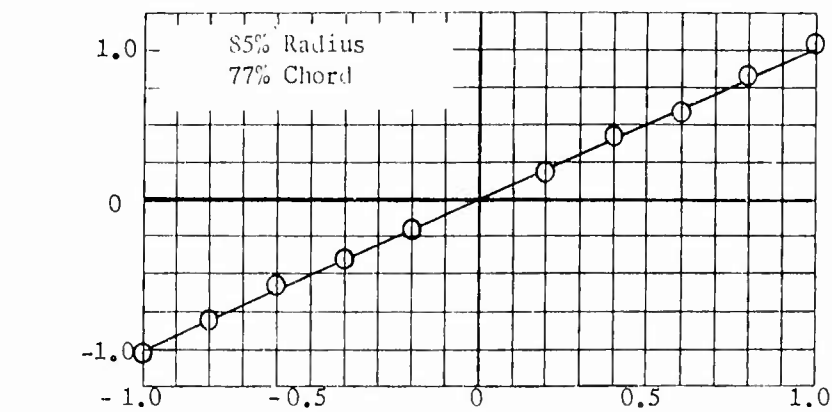


FIGURE 24d -  
Differential  
Pressure

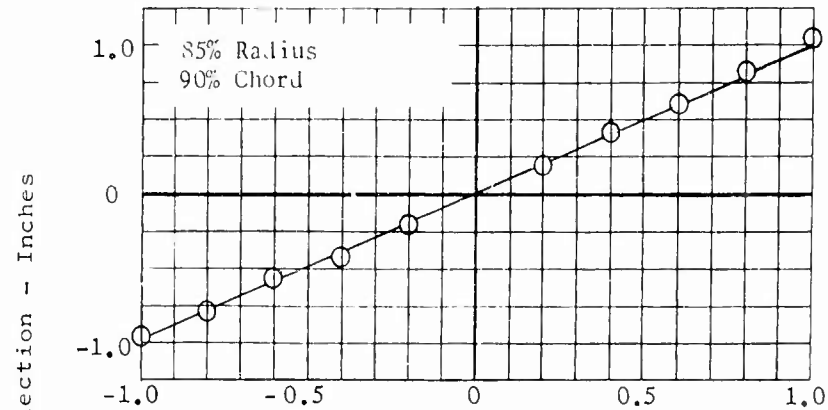


FIGURE 24d -  
Differential  
Pressure

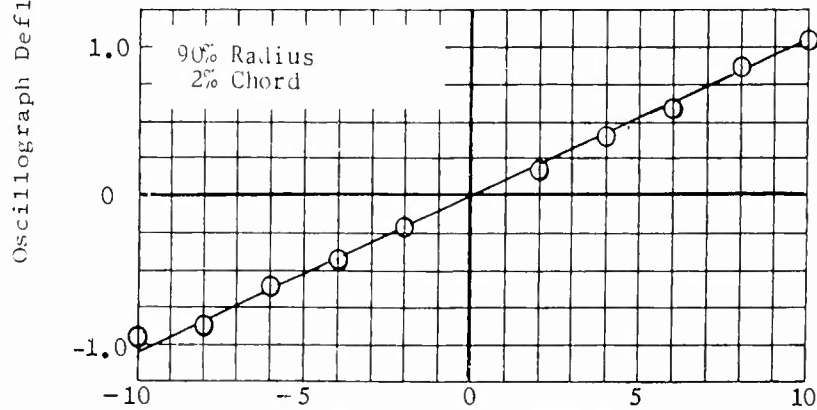


FIGURE 24e -  
Differential  
Pressure

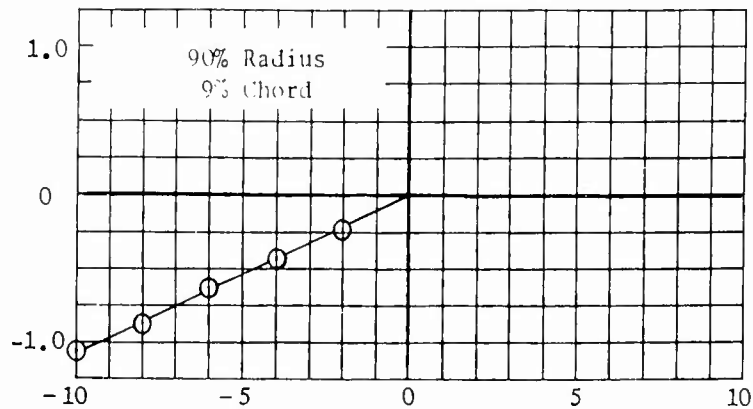


FIGURE 24e -  
Differential  
Pressure

Differential Pressure - p.s.i.

FIGURE 24 - PRESSURE TRANSDUCER CALIBRATION CURVES .

Oscillograph Deflection - Inches

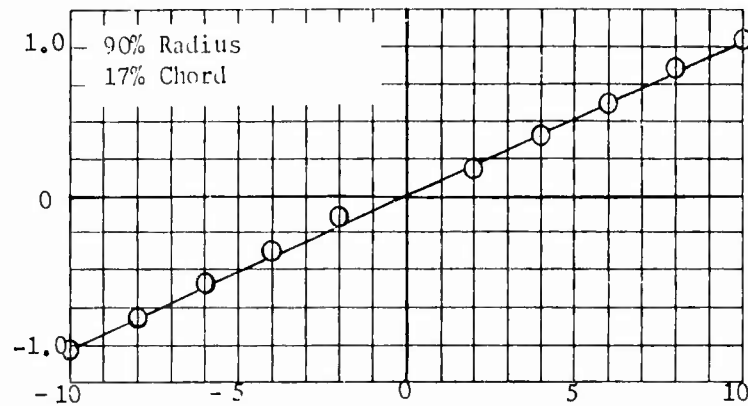


FIGURE 24e -  
Differential  
Pressure.

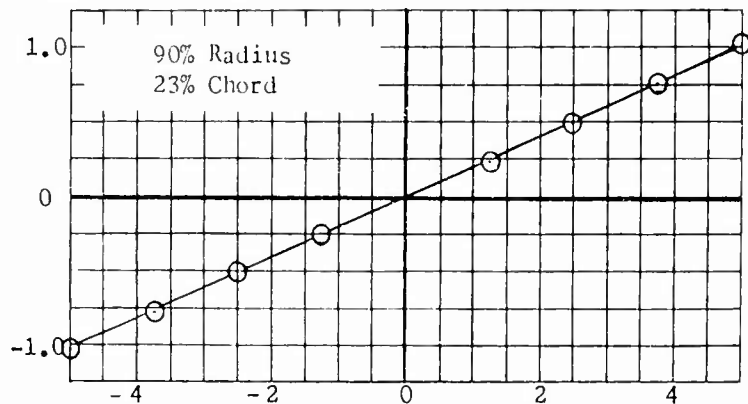


FIGURE 24e -  
Differential  
Pressure.

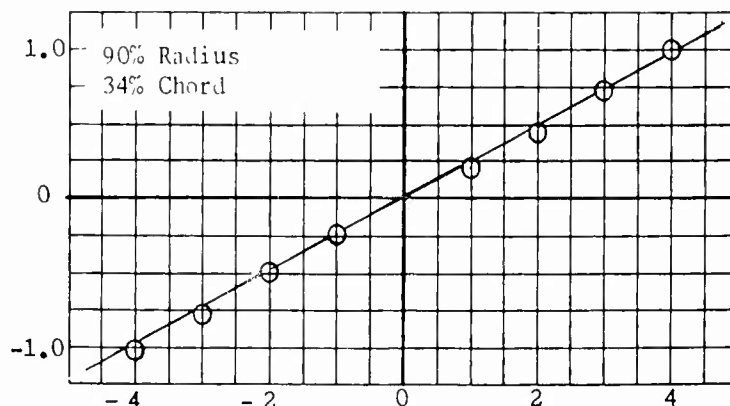


FIGURE 24e -  
Differential  
Pressure.

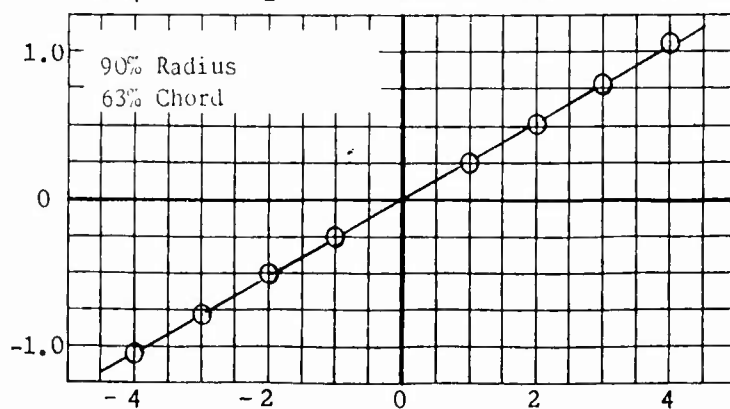


FIGURE 24e -  
Differential  
Pressure.

Differential Pressure - p.s.i.

FIGURE 24 - PRESSURE TRANSDUCER CALIBRATION CURVES.

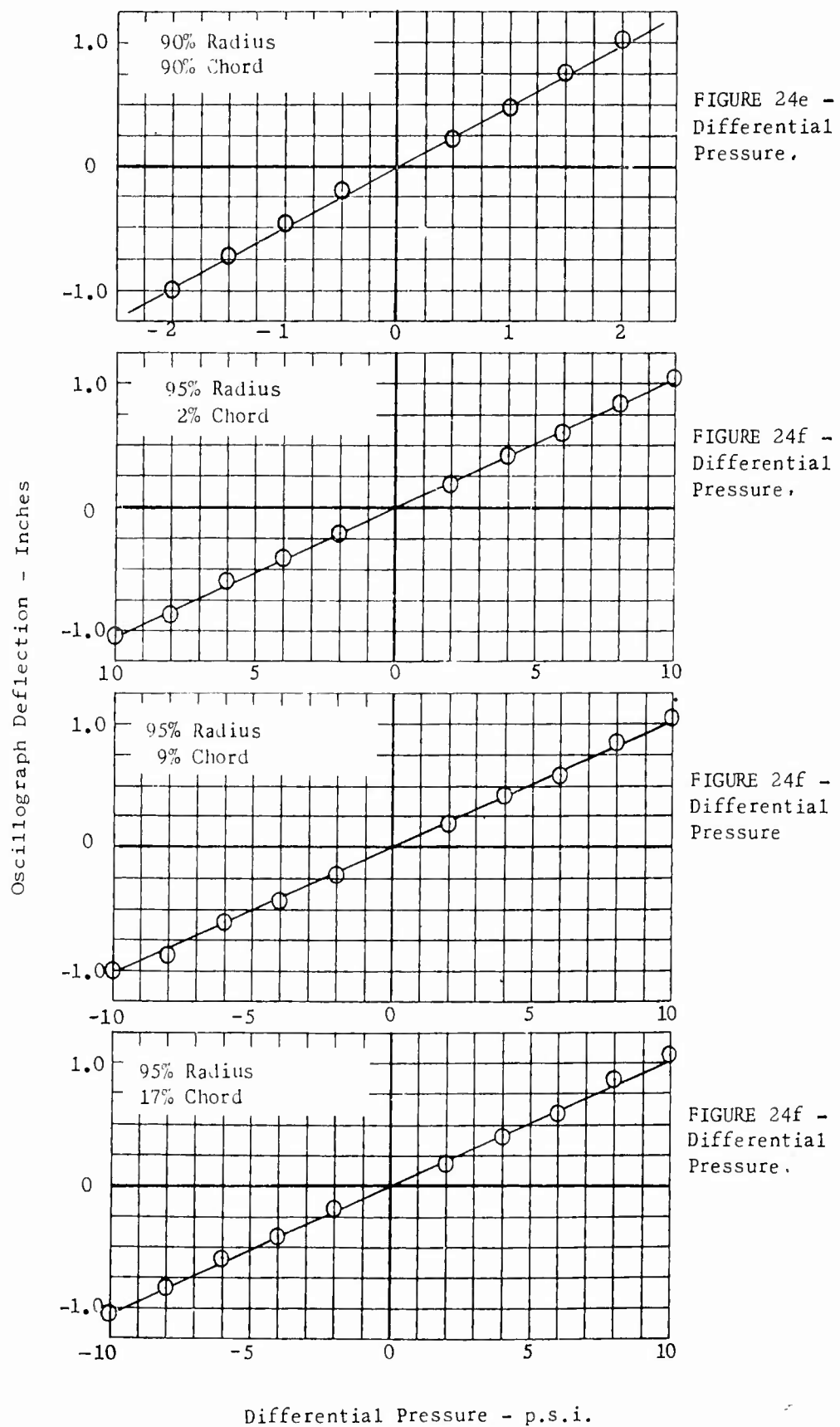


FIGURE 24 - PRESSURE TRANSDUCER CALIBRATION CURVES.

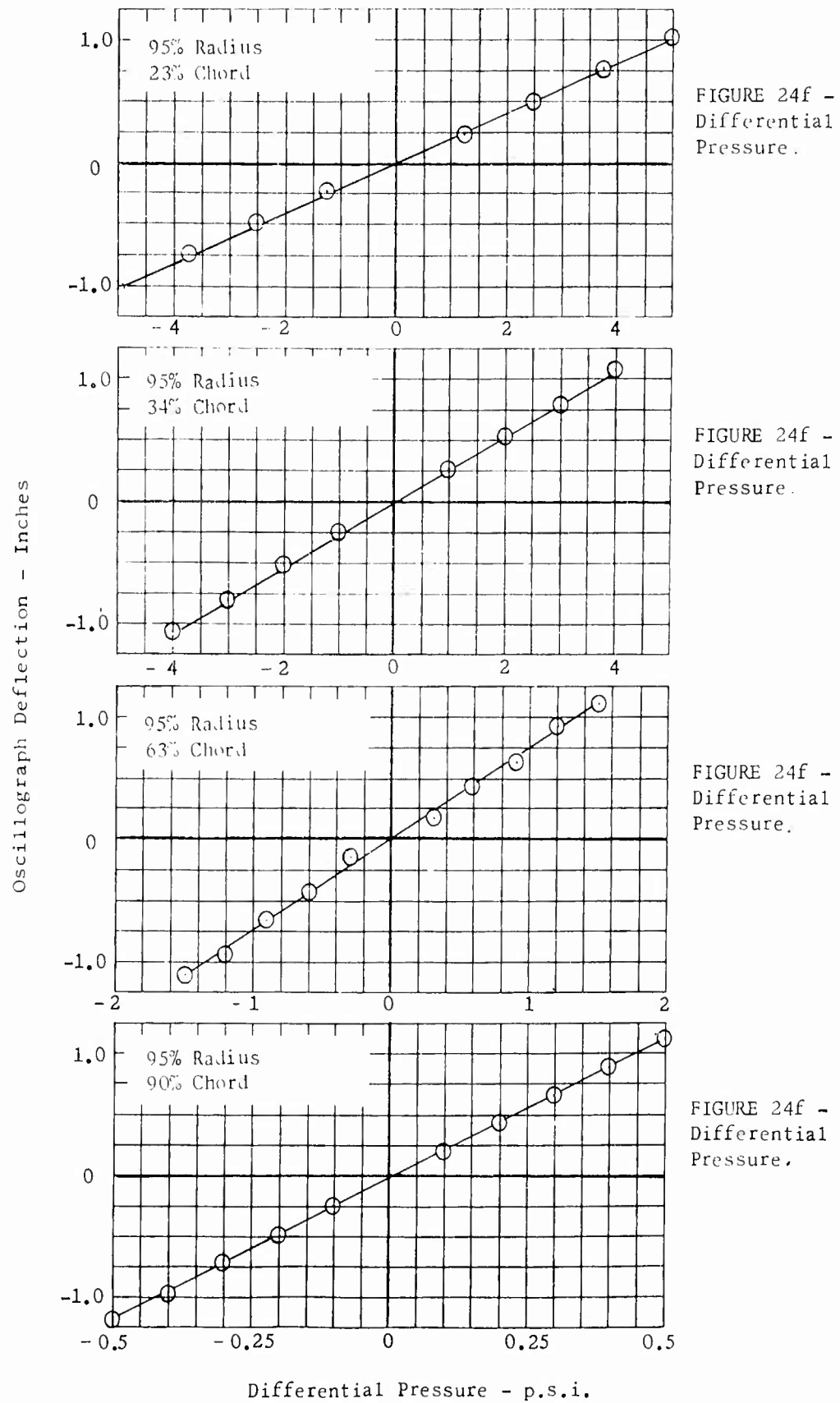


FIGURE 24 - PRESSURE TRANSDUCER CALIBRATION CURVES .

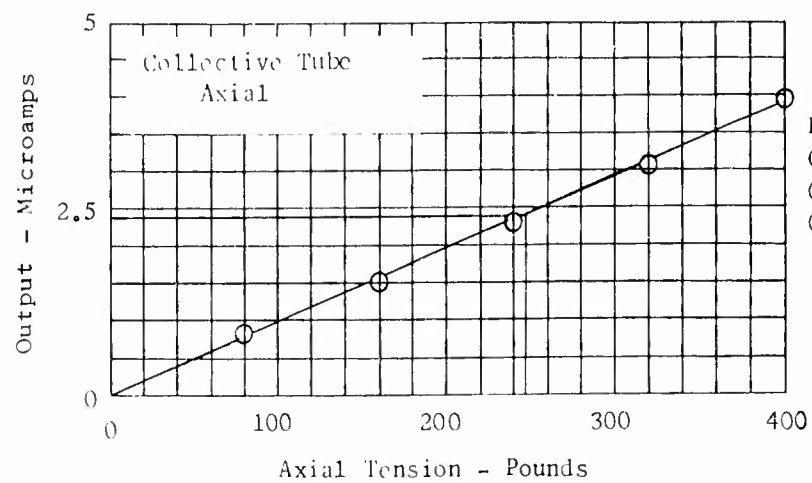


FIGURE 25a -  
Collective Tube  
Calibration  
Curve .

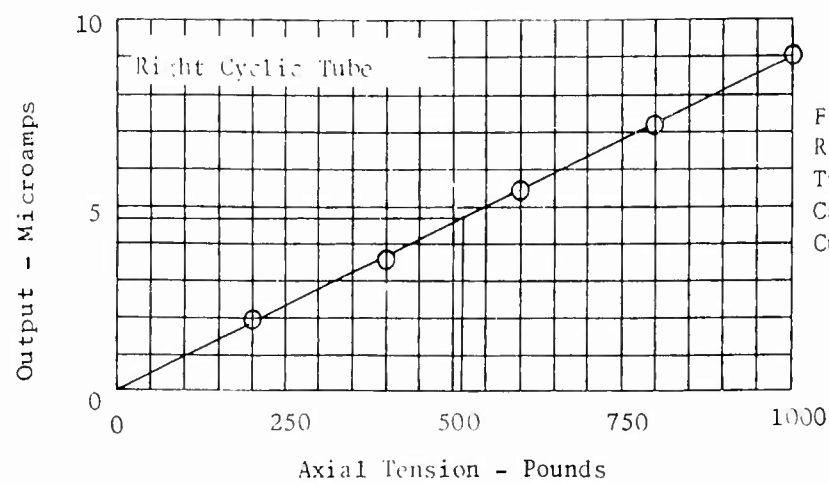


FIGURE 25b -  
Right Cyclic  
Tube  
Calibration  
Curve .

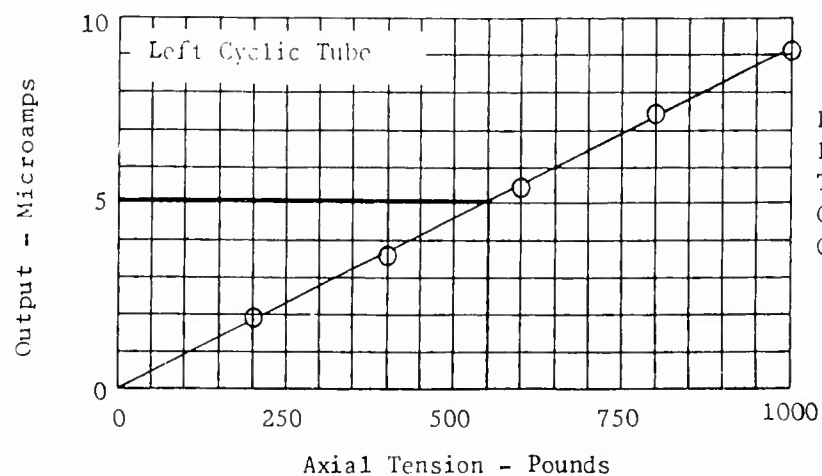


FIGURE 25c -  
Left Cyclic  
Tube  
Calibration  
Curve .

FIGURE 25 - CONTROL TUBES CALIBRATION CURVES .

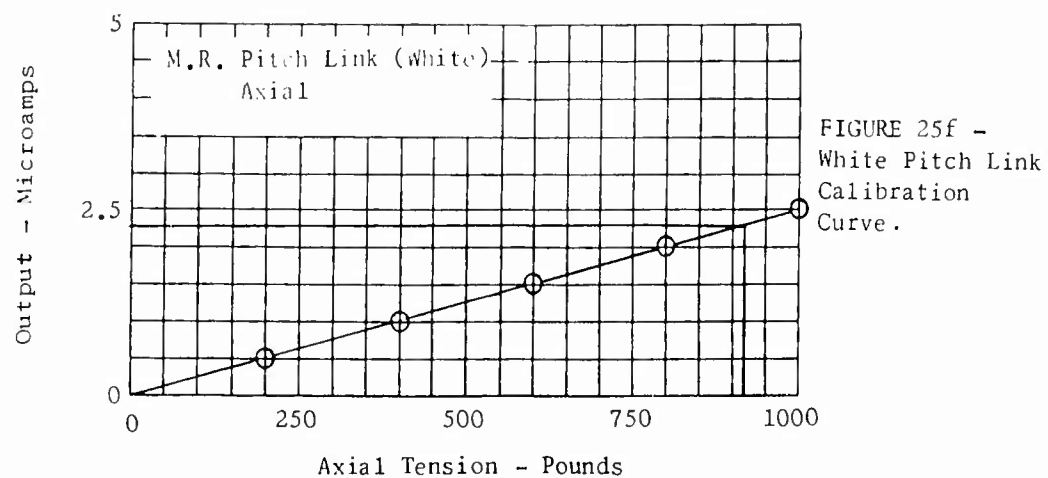
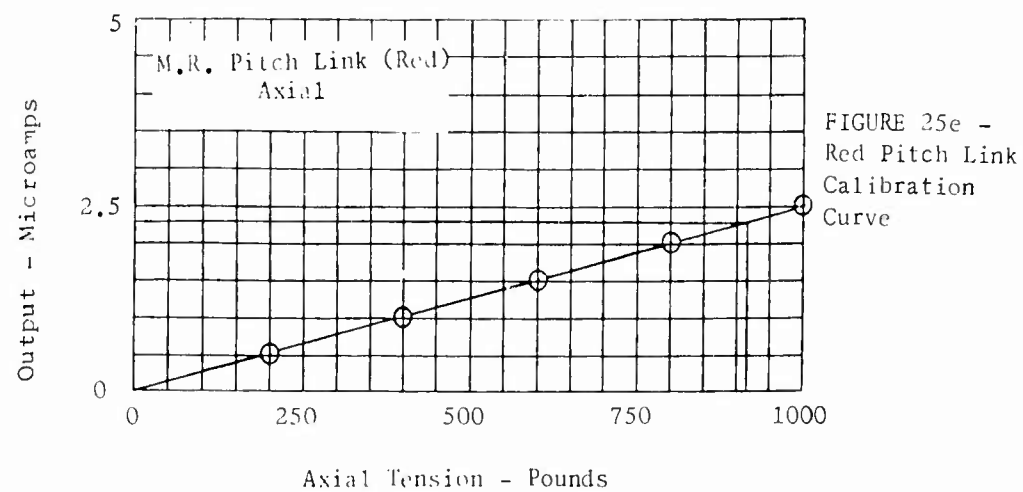
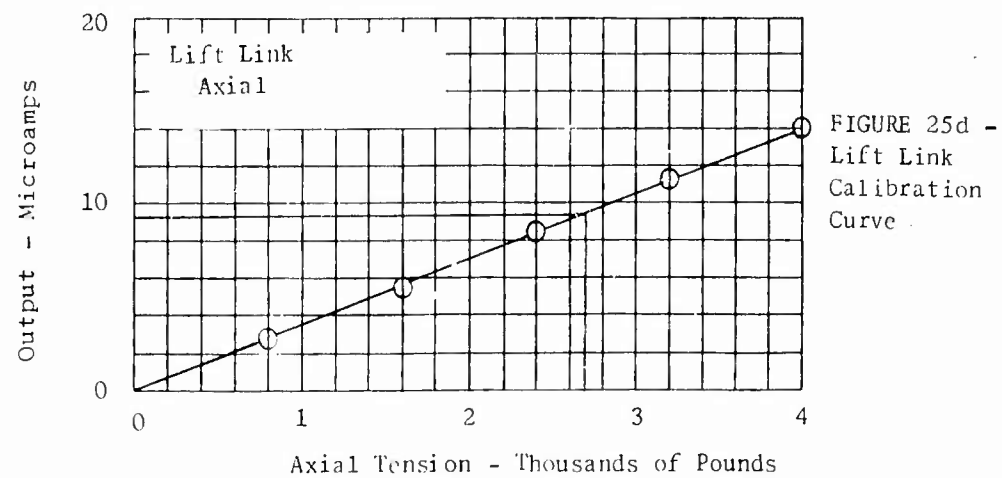


FIGURE 25 - CONTROL TUBES CALIBRATION CURVES .

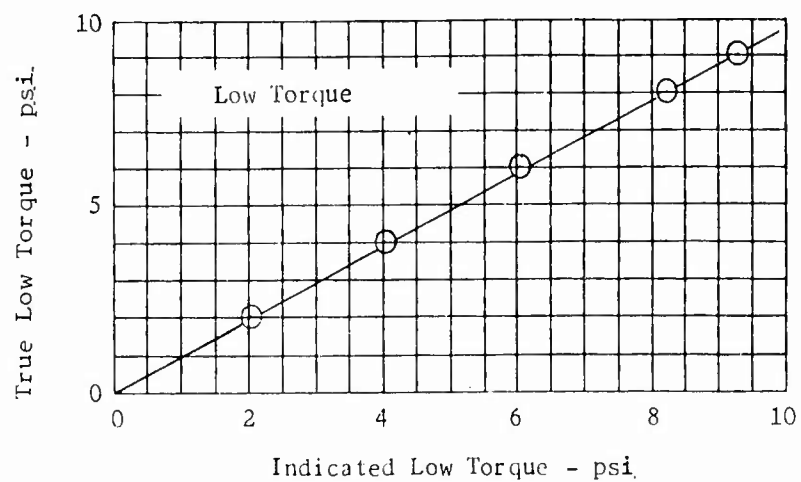


FIGURE 26a -  
Engine Low  
Torque  
Calibration  
Curve.

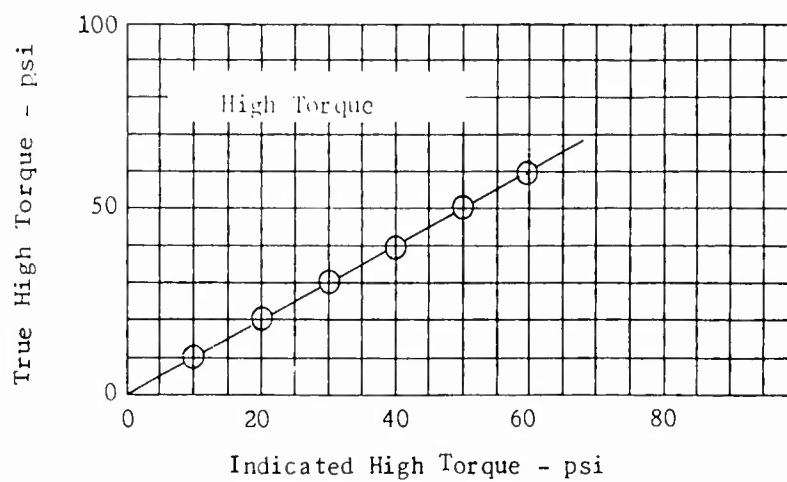


FIGURE 26b -  
Engine High  
Torque  
Calibration  
Curve

FIGURE 26 - PHOTO PANEL INSTRUMENTS  
CALIBRATION CURVES.

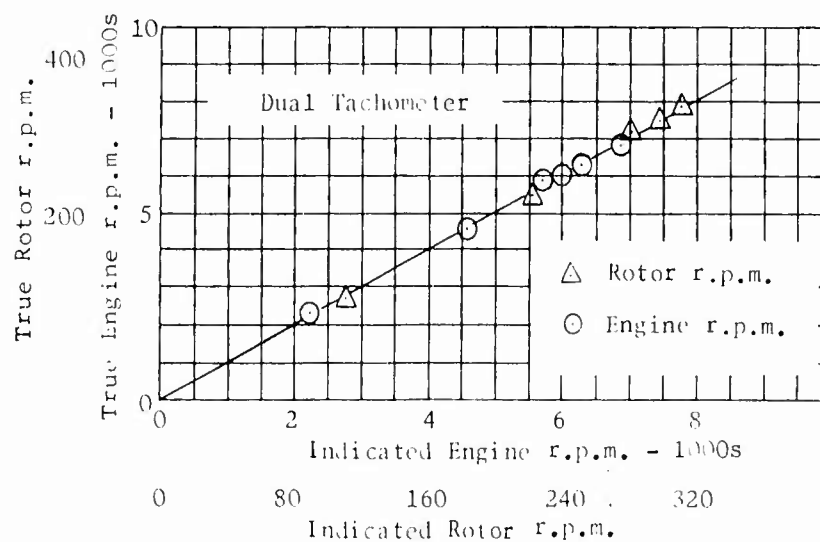


FIGURE 26c -  
Tachometer  
Calibration  
Curve.

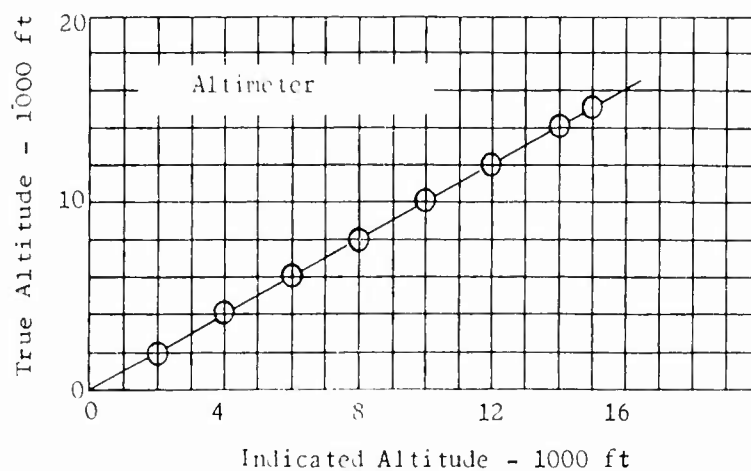


FIGURE 26d -  
Altimeter  
Calibration  
Curve.

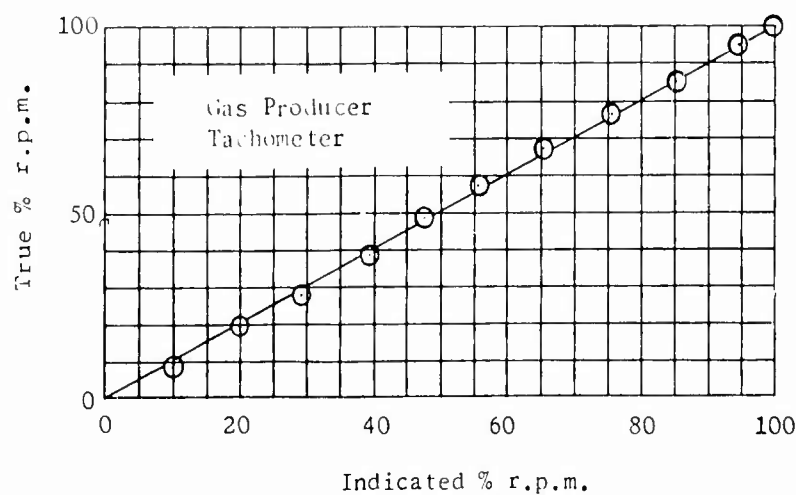


FIGURE 26e -  
Gas Producer  
Tachometer  
Calibration  
Curve

FIGURE 26 - PHOTO PANEL INSTRUMENTS CALIBRATION CURVES.



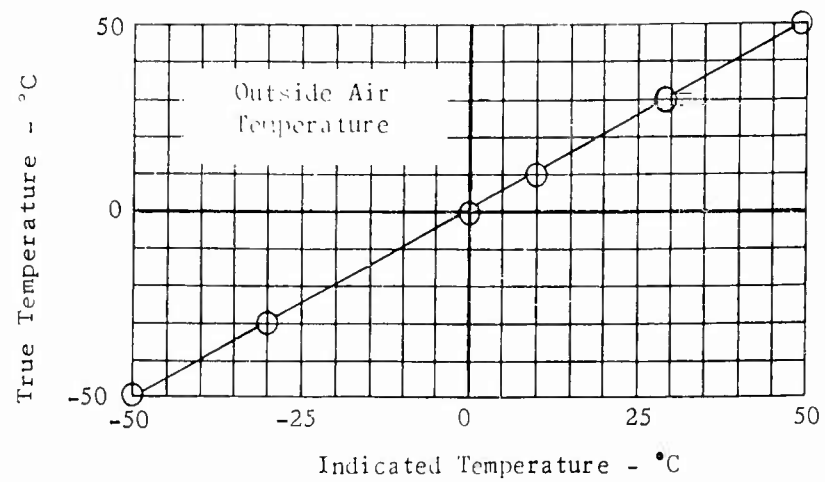


FIGURE 26f -  
O.A.T.  
Indicator  
Calibration  
Curve

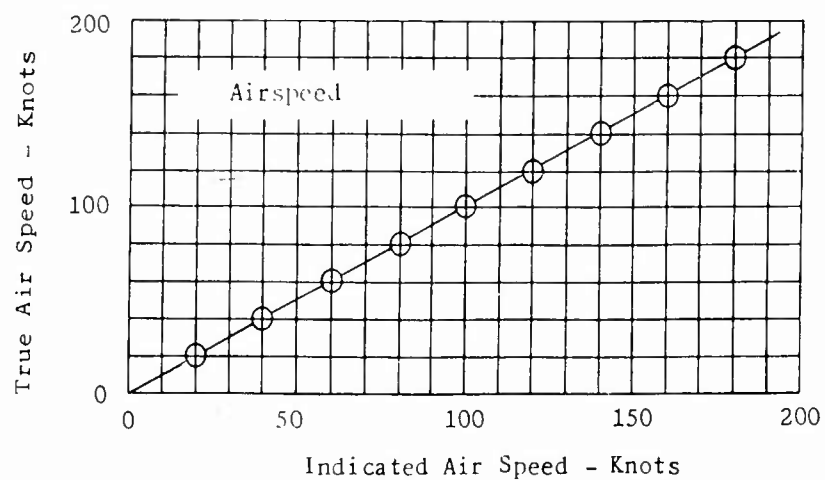


FIGURE 26g -  
Airspeed  
Indicator  
Calibration  
Curve,

FIGURE 26 - PHOTO PANEL INSTRUMENTS  
CALIBRATION CURVES.

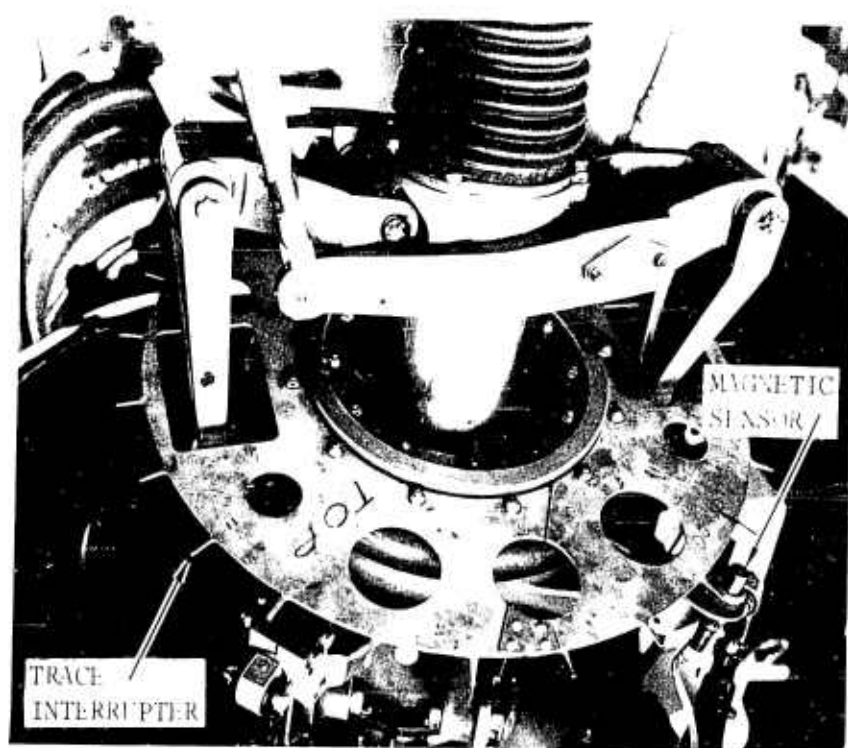
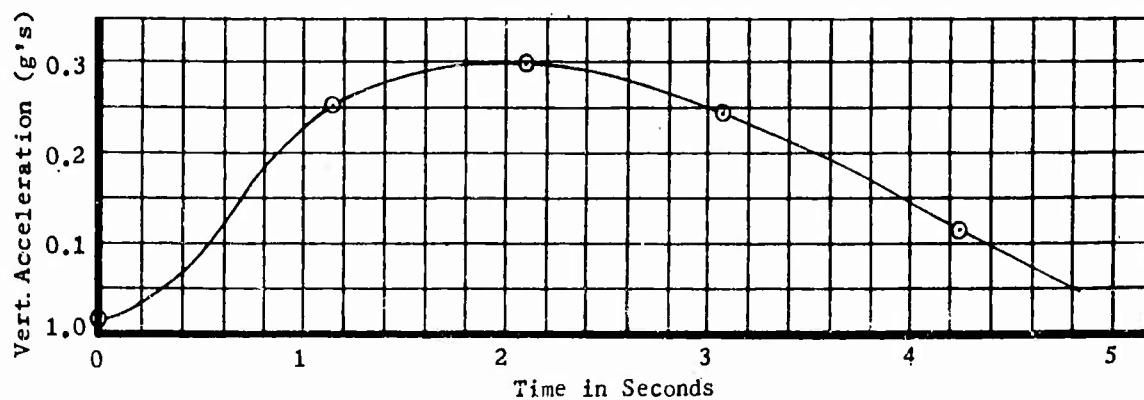
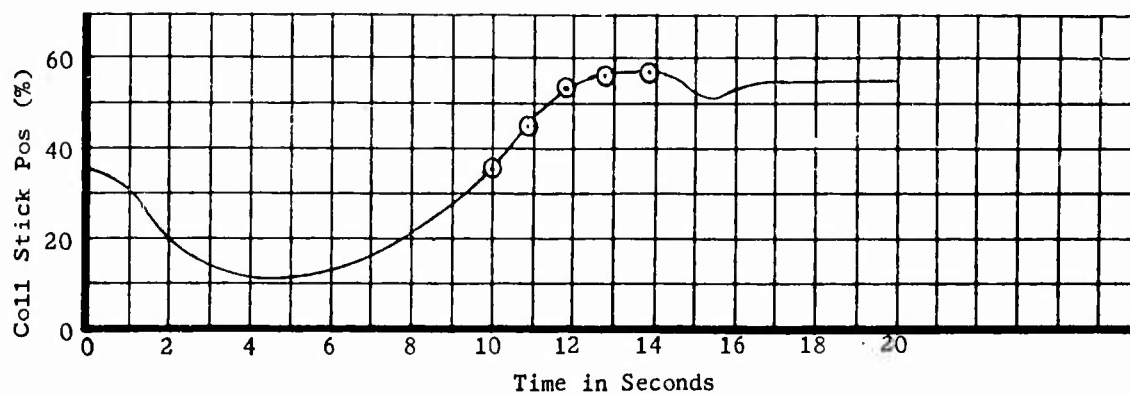


FIGURE 27 - SWASHPLATE MOUNTED AZIMUTH TRACE INTERRUPTER.



⊙ The five rotor revolutions that were reduced occurred at this point during maneuver.

FIGURE 28 - CONDITION NO. 34, SYMMETRICAL PULL-UP TIME HISTORY.



⊙ The five rotor revolutions that were reduced occurred at this point during maneuver.

FIGURE 29 - CONDITION NO. 38, APPROACH AND FLARE TIME HISTORY.

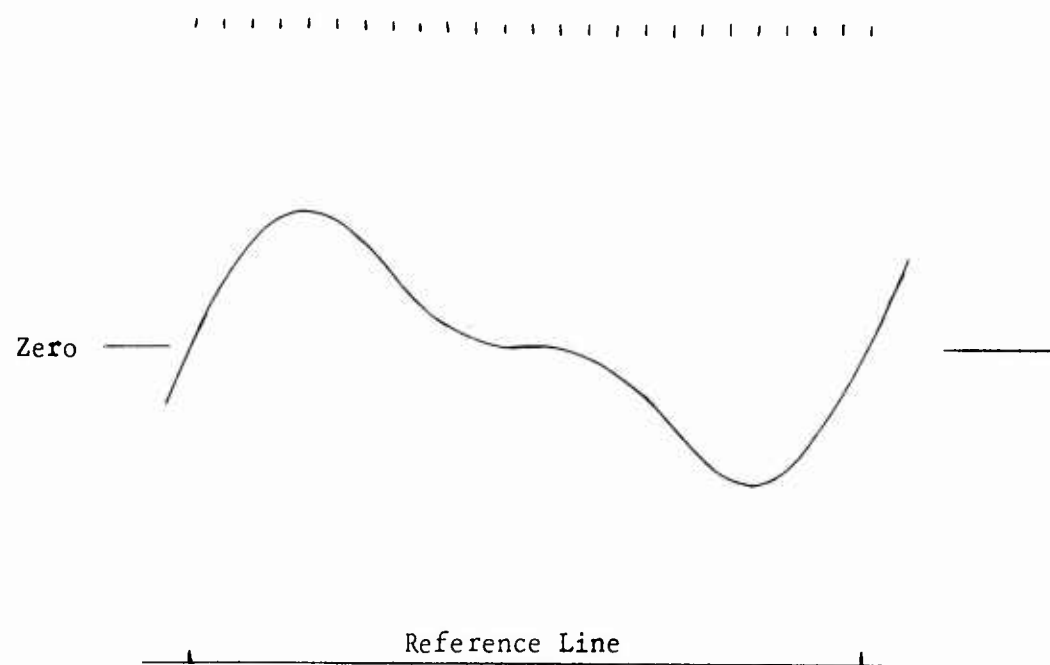


FIGURE 30 - SECOND HARMONIC CURVE, TEST CASE.

FIGURE 31, GRAPHICAL DATA

TYPE I CONDITION NO. 23

MAXIMUM POWER CLIMB, TRUE AIRSPEED = 20 KNOTS

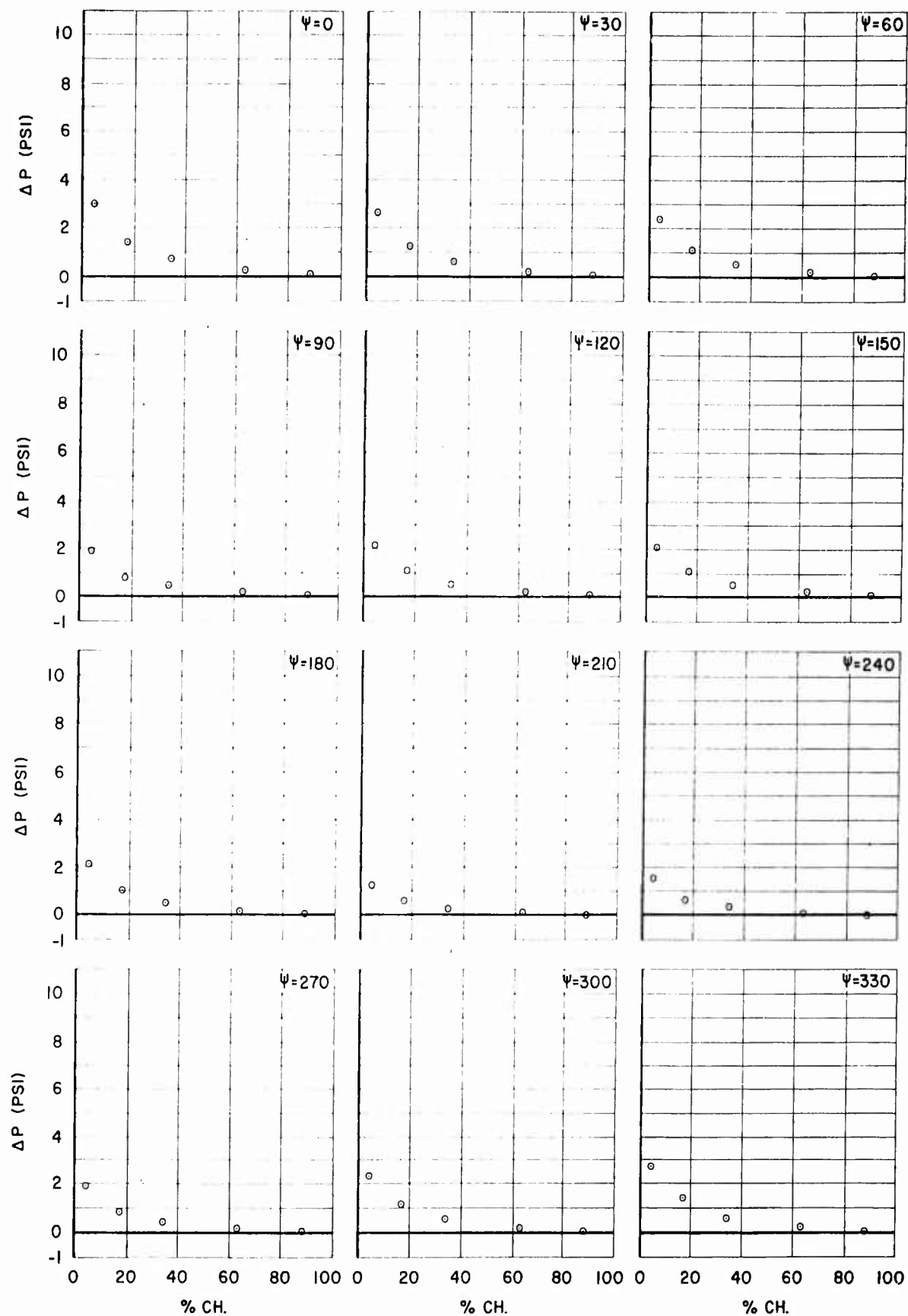


Figure 31a  $-\Delta P$  vs % CHORD (40% R, COND.NO.23, MAX.PWR.CLIMB,  $V_{true} = 20$  KNOTS),

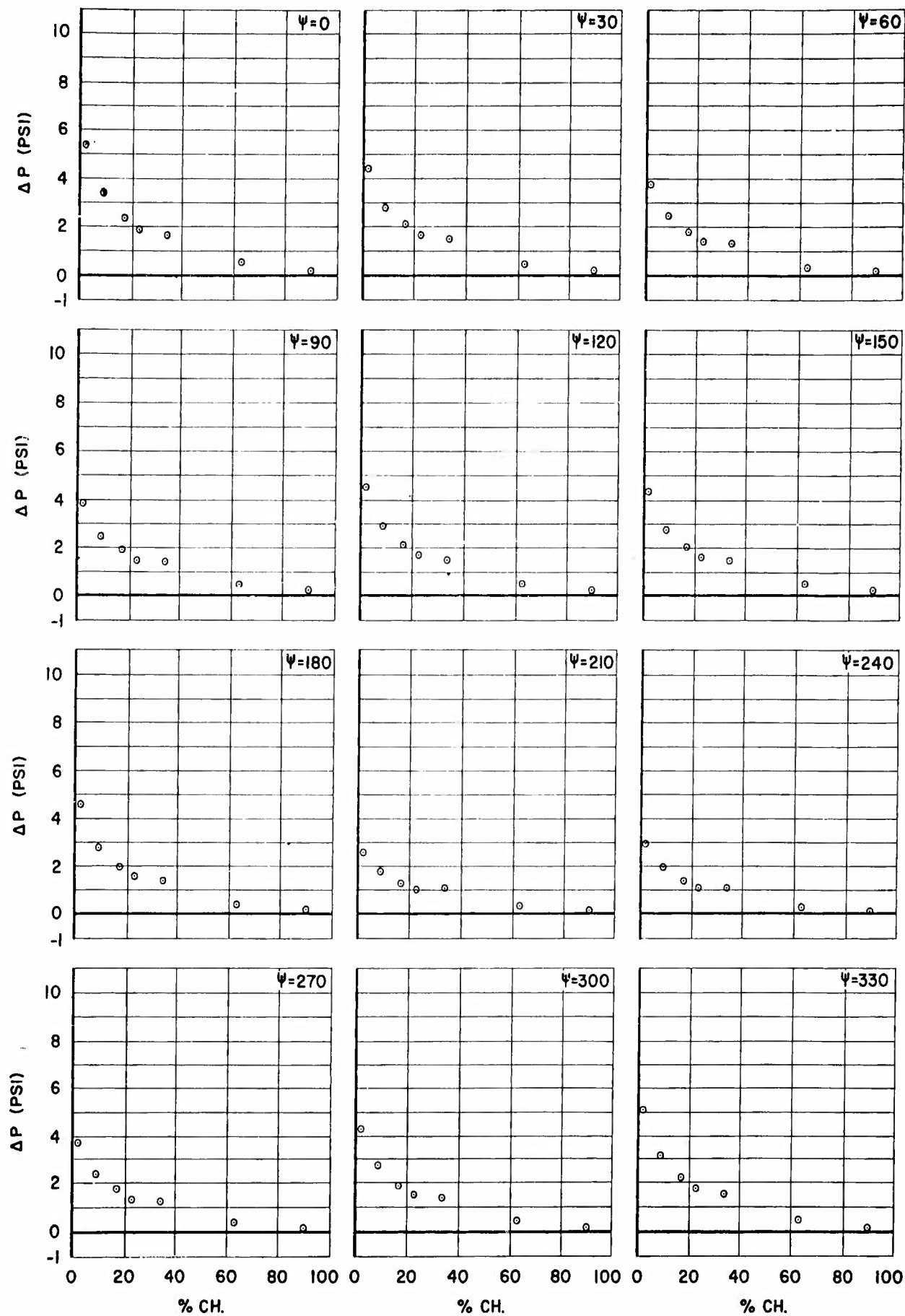


Figure 31b  $-\Delta P$  vs % CHORD (55% R, COND.NO.23, MAX.PWR.CLIMB,  $V_{true} = 20$  KNOTS).

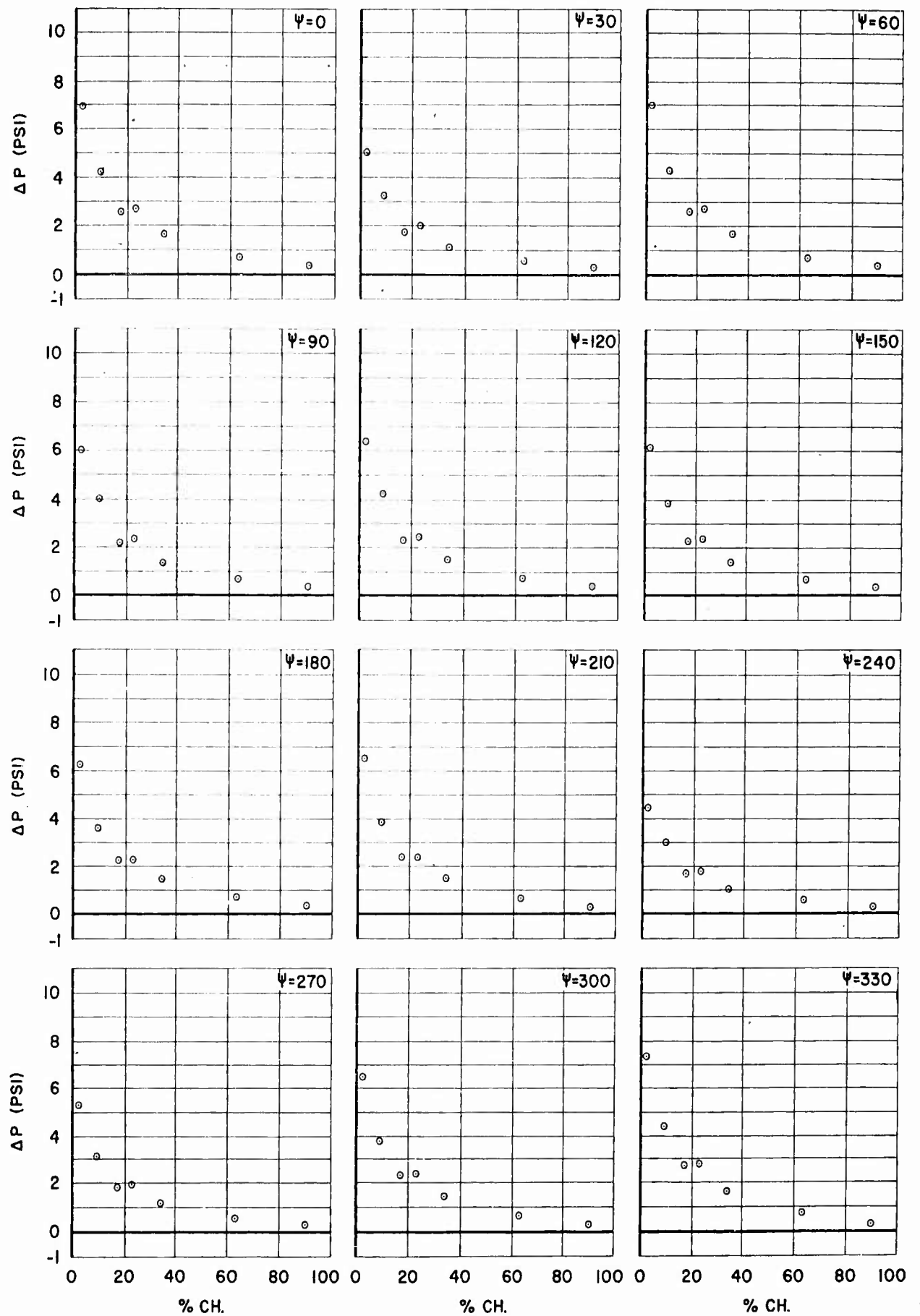


Figure 31c  $-\Delta P$  vs % CHORD (75% R, COND.NO.23, MAX.PWR.CLIMB,  $V_{true} = 20$  KNOTS).



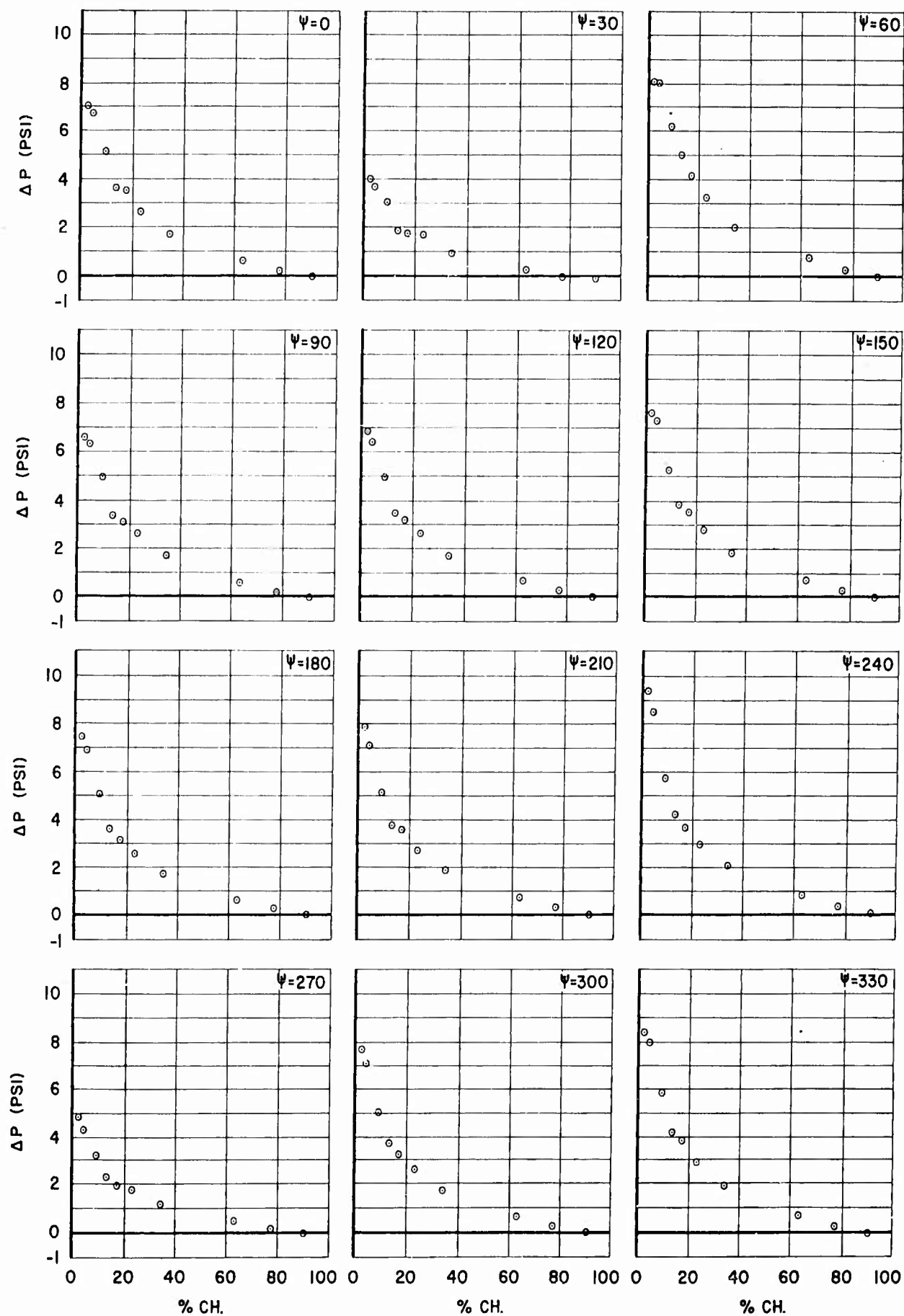


Figure 31d  $\Delta P$  vs % CHORD (85% R, COND.NO.23, MAX.PWR.CLIMB,  $V_{true} = 20$  KNOTS).

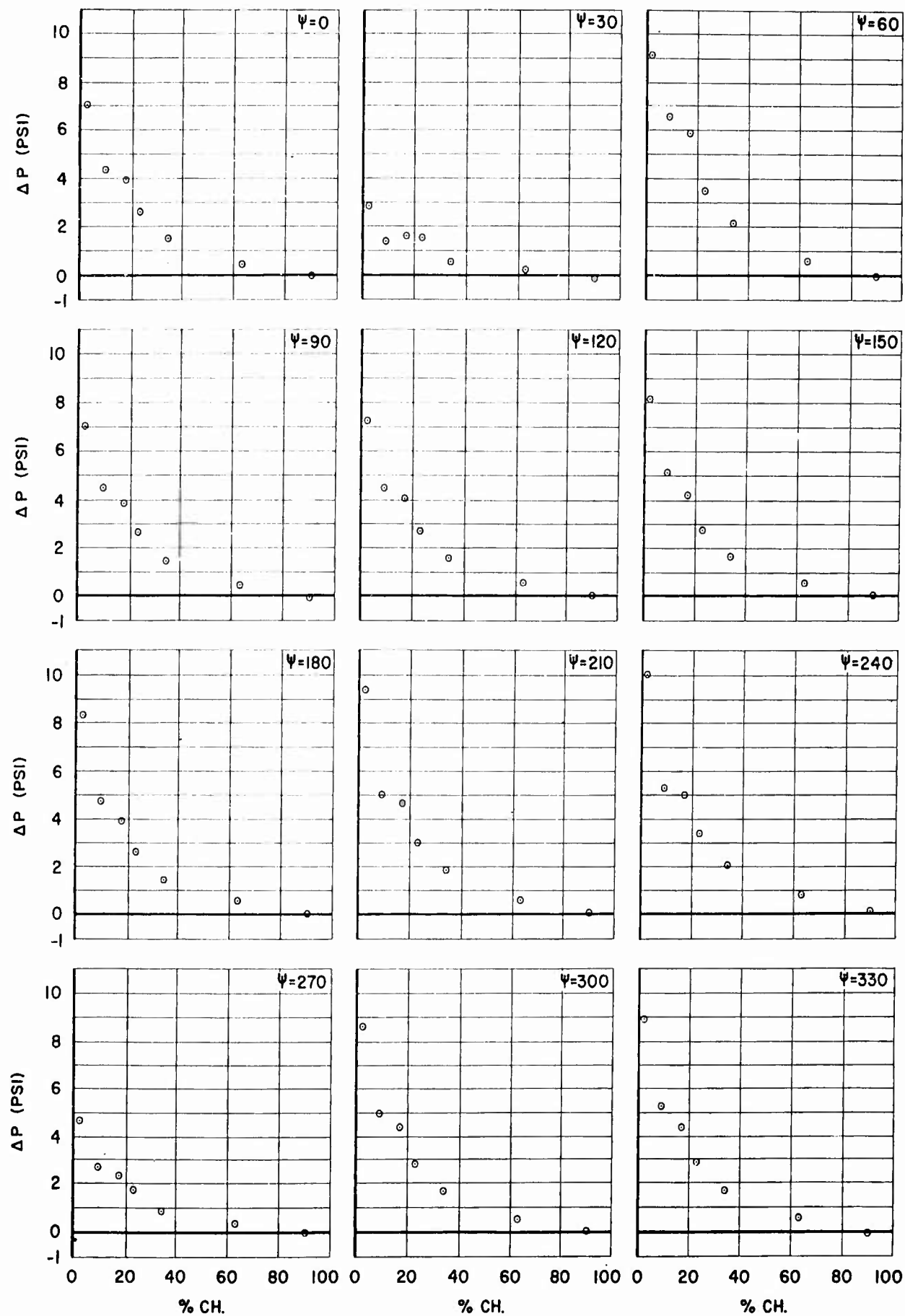


Figure 31e  $-\Delta P$  vs % CHORD (90% R, COND.NO.23, MAX.PWR.CLIMB,  $V_{true} = 20$  KNOTS).

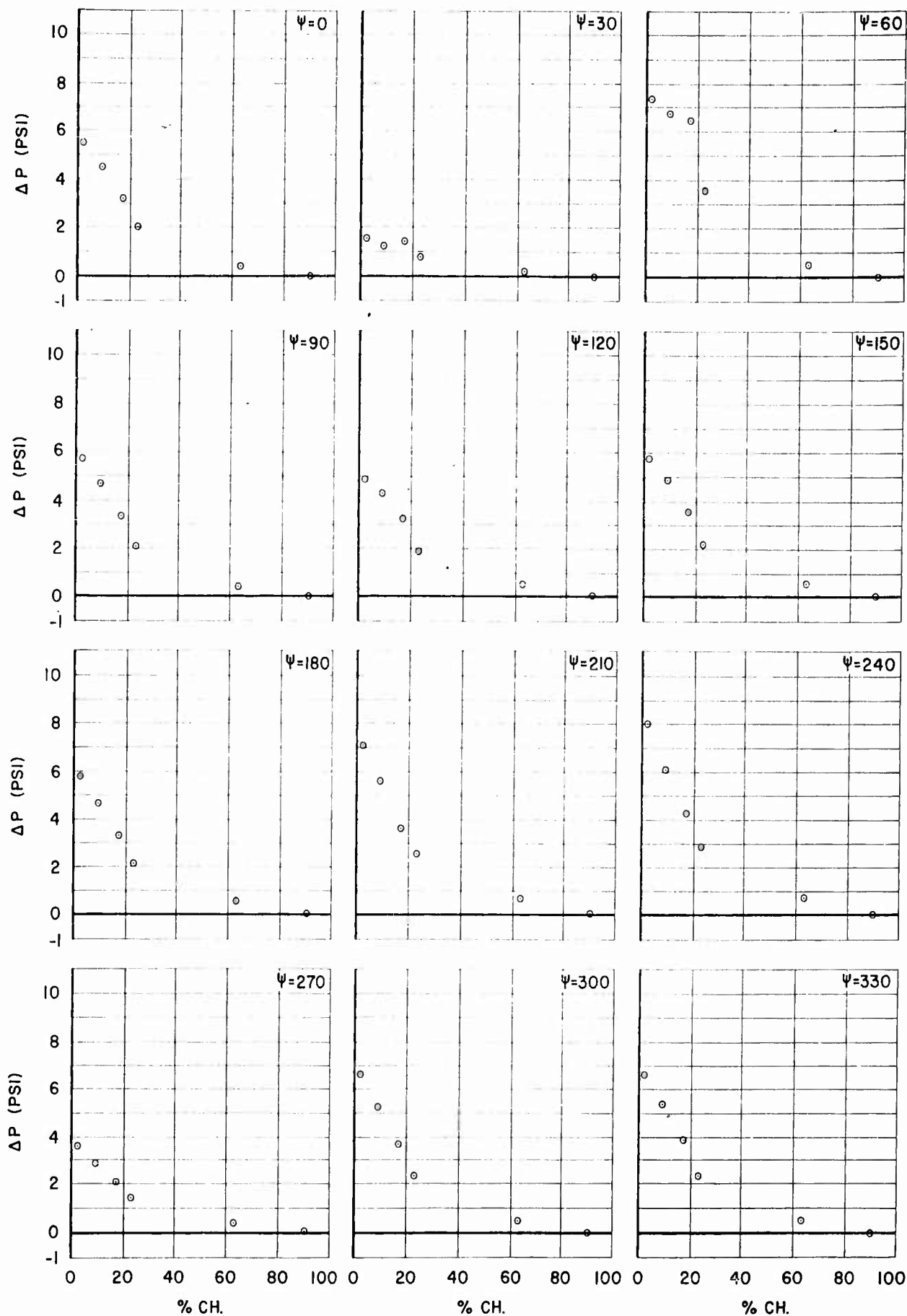


Figure 31f  $-\Delta P$  vs % CHORD (95% R, COND.NO.23, MAX.PWR.CLIMB,  $V_{true} = 20$  Knots).

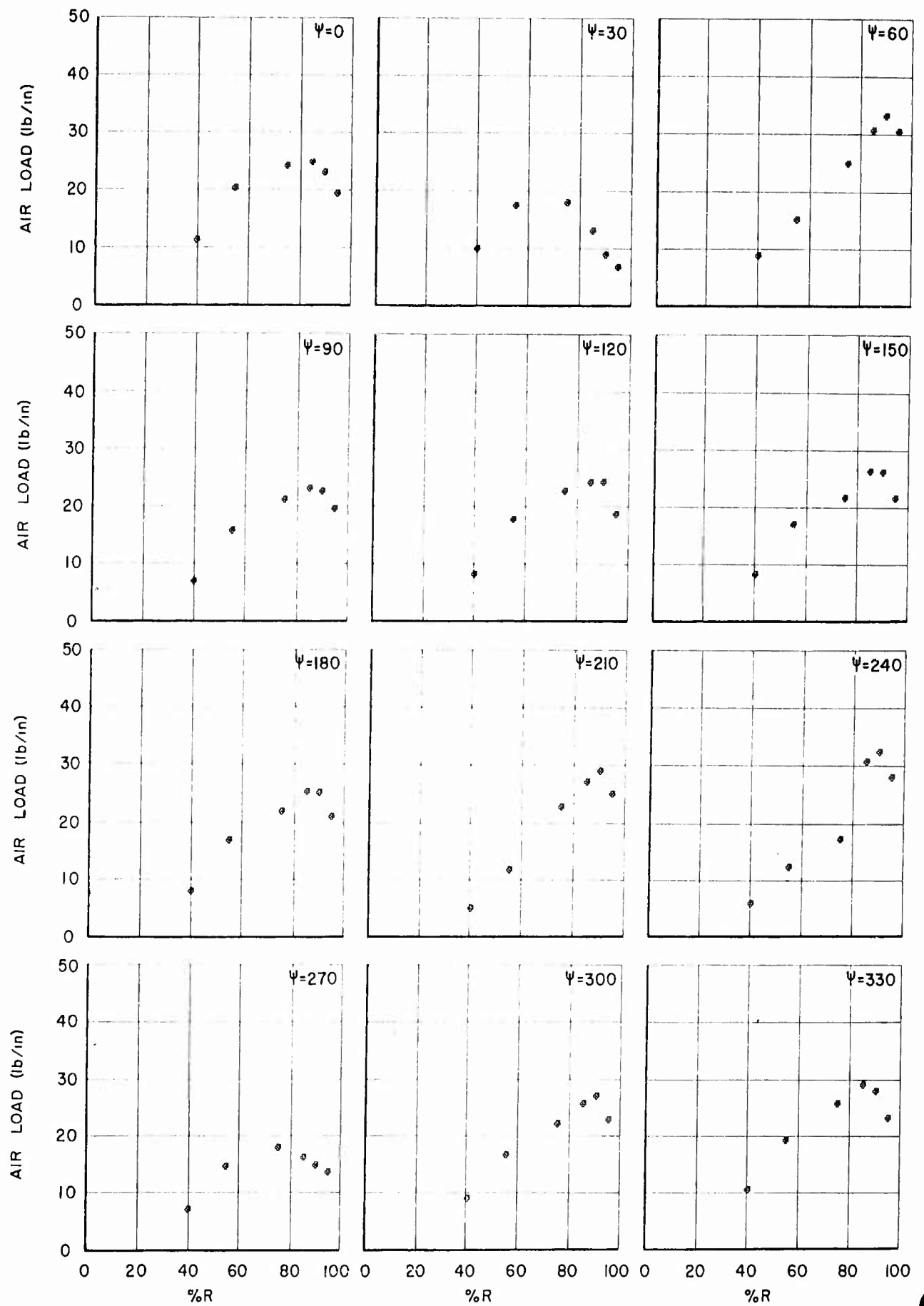


Figure 31g - AIR LOAD vs % RADIUS (COND.NO.23,MAX.PWR.CLIMB,  $V_{true} = 20$  KNOTS).

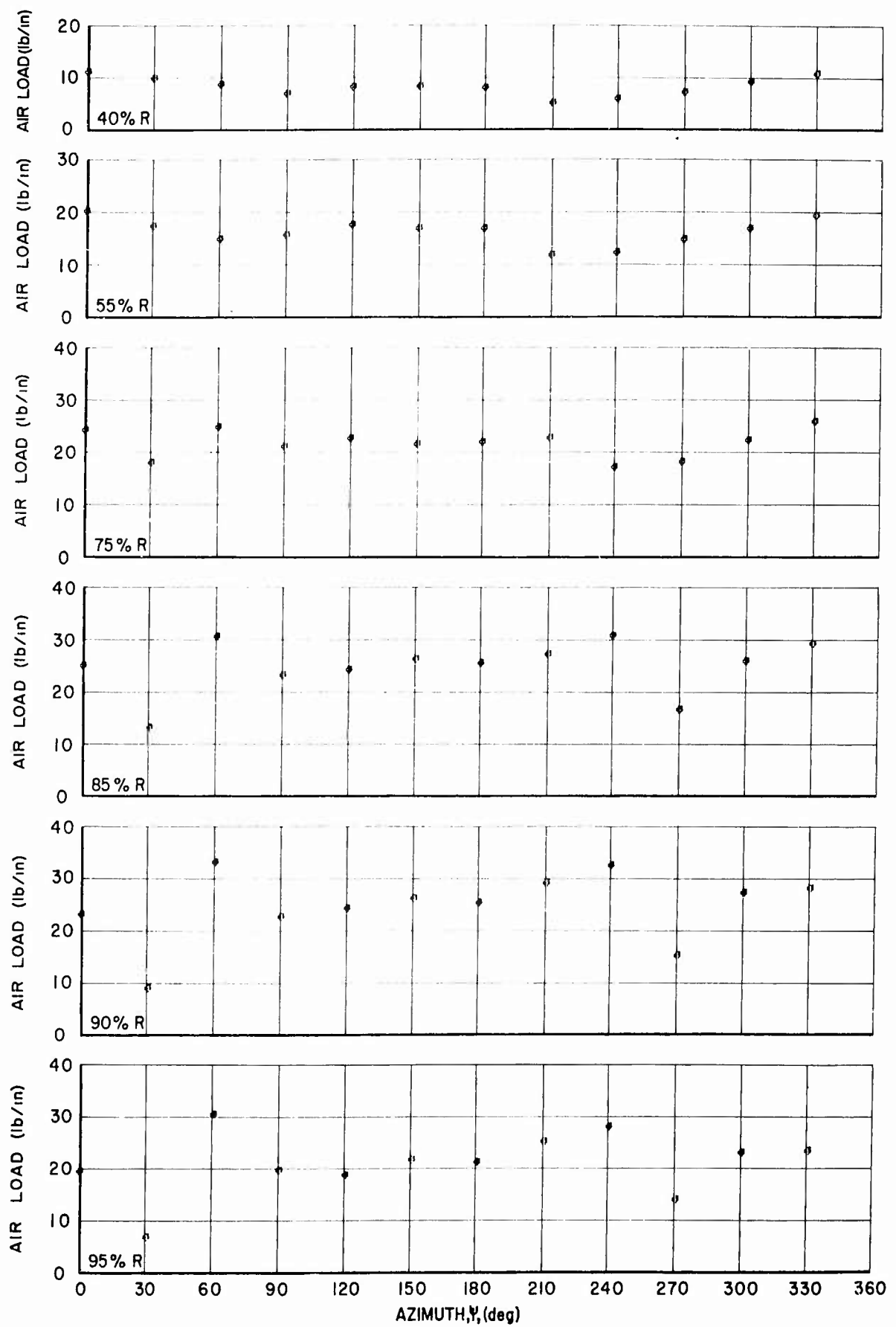


Figure 31h - AIR LOAD vs AZIMUTH (COND.NO.23,MAX.PWR.CLIMB,  $V_{true} = 20$  KNOTS).

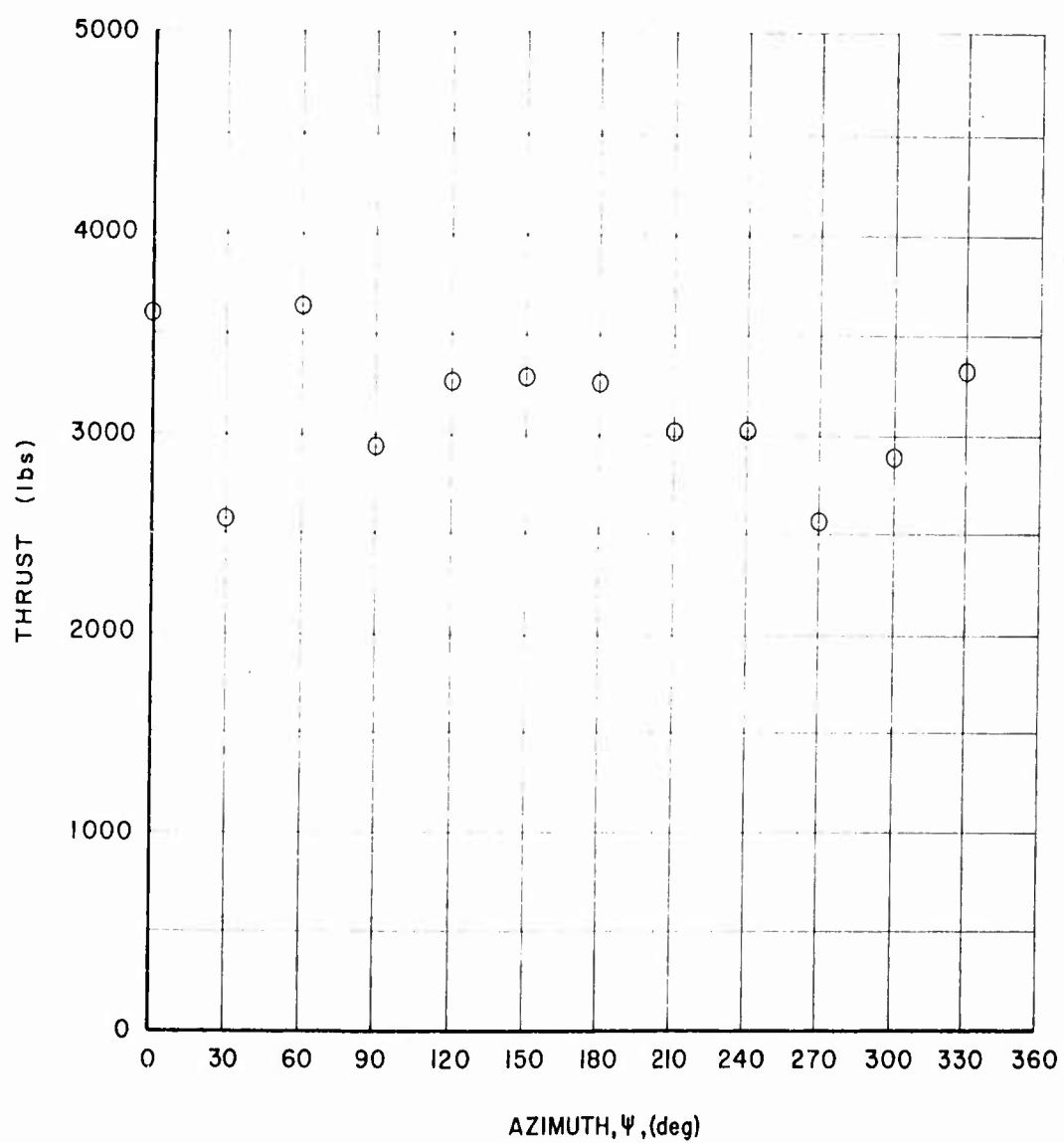


Figure 31i TOTAL THRUST/BLADE vs AZIMUTH  
(COND.NO.23,MAX.FWR.CLIMB,Vtrue=20KNOTS).

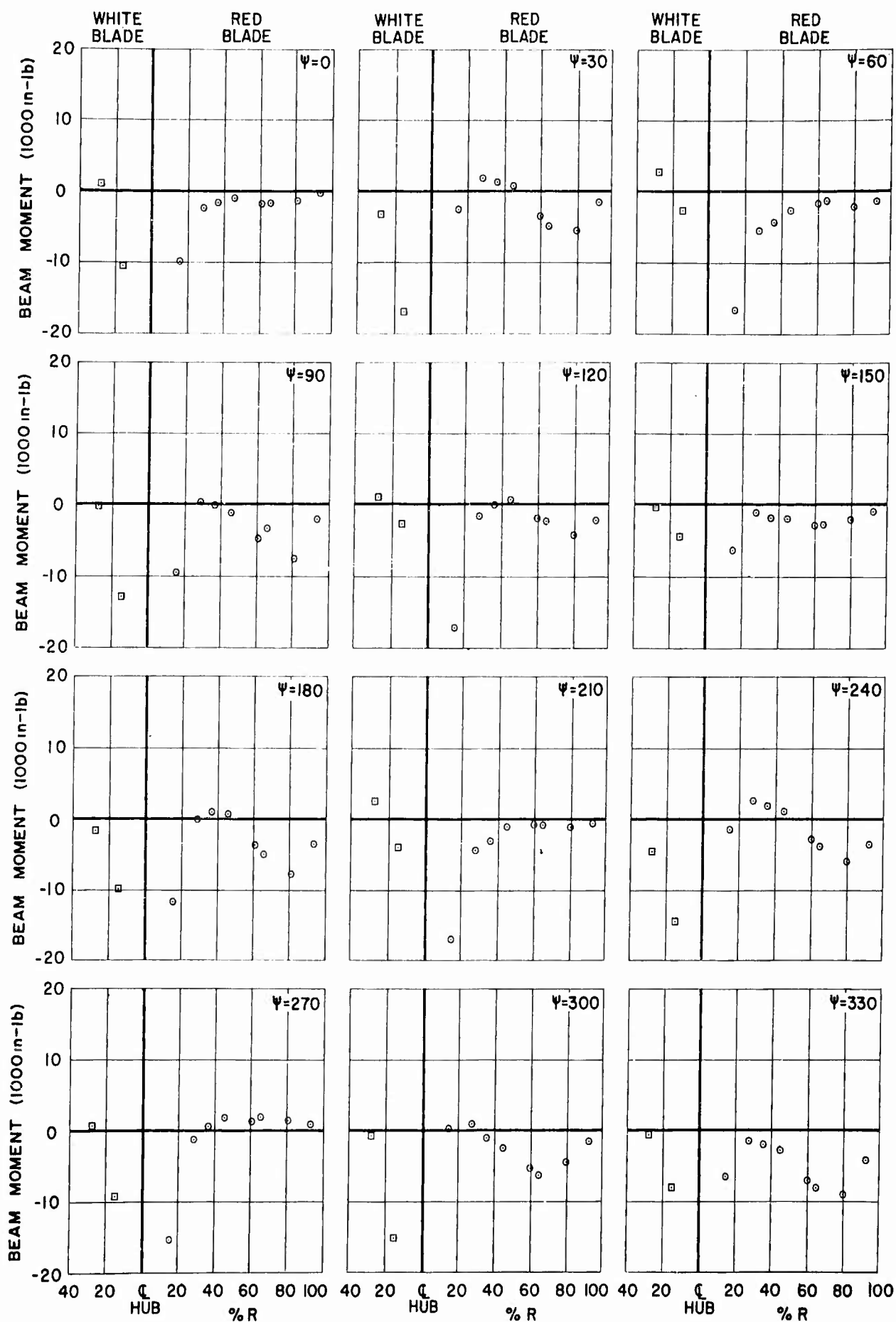


Figure 31j - BEAM MOMENT vs % RADIUS (COND.NO.23,MAX.PWR.CLIMB,Vtrue = 20 KNOTS).

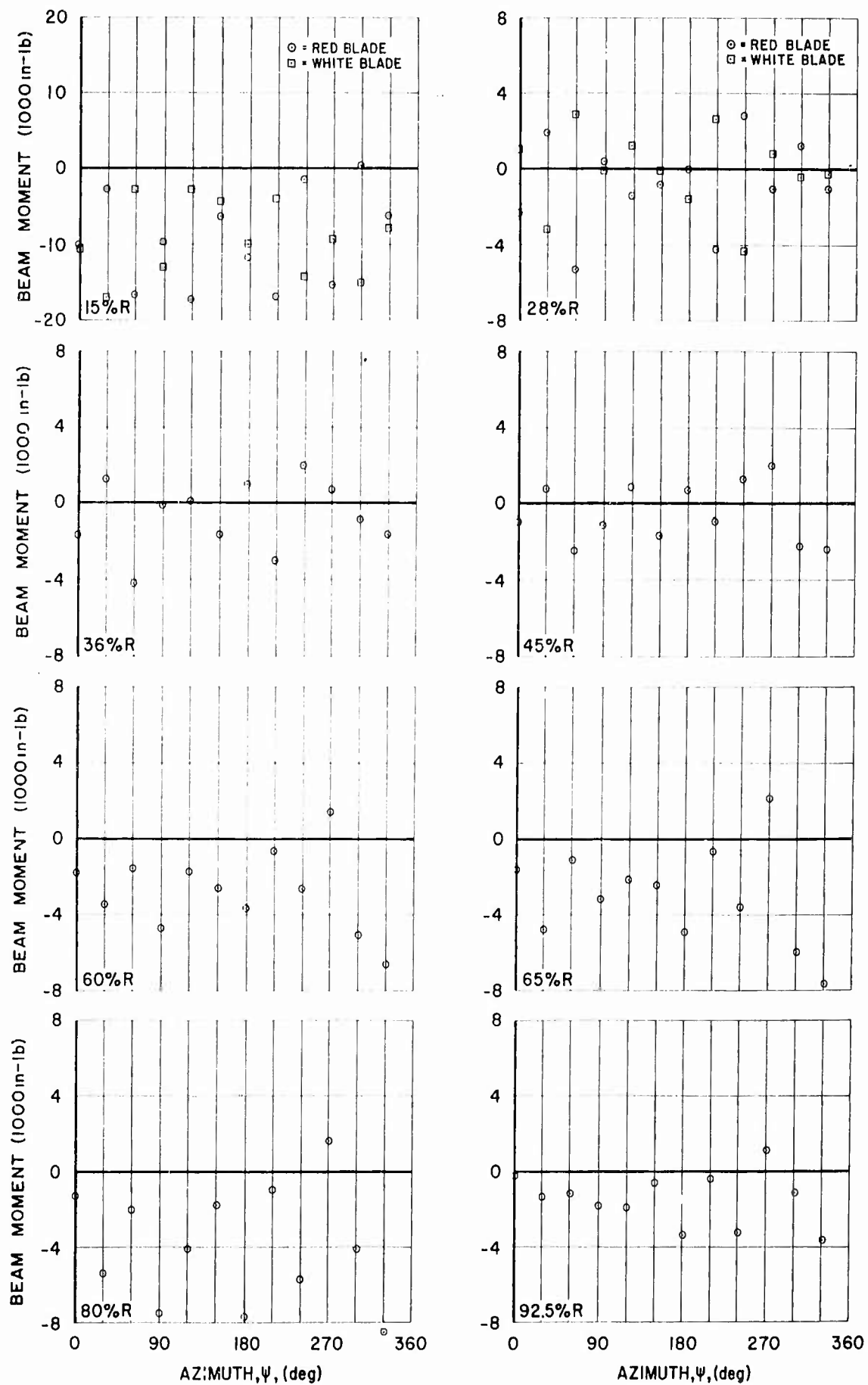


Figure 31k - BEAM MOMENT vs AZIMUTH (COND.NO.23, MAX.PWR.CLIMB,  $V_{true}=20$  KNOTS).



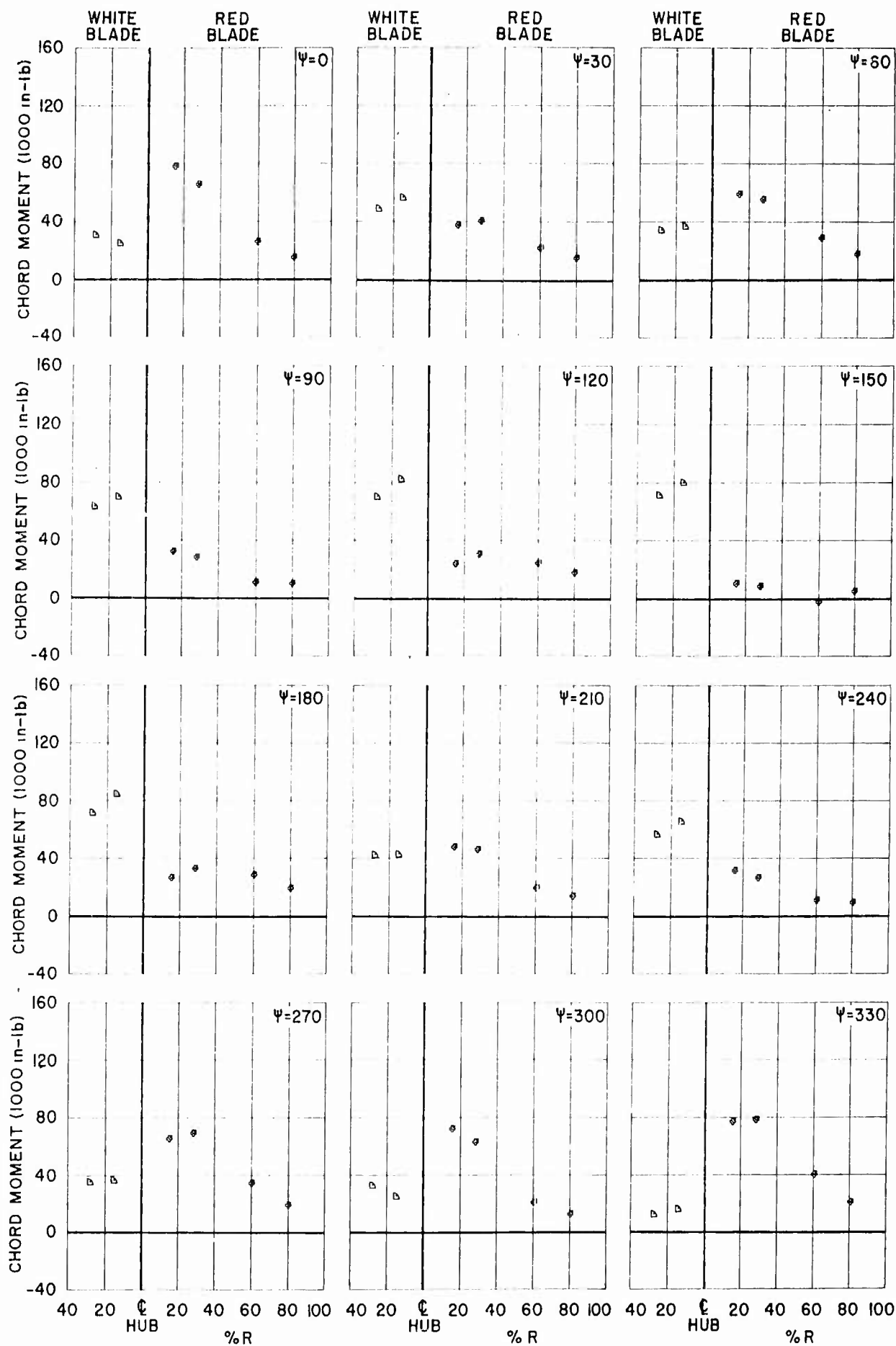


Figure 31m - CHORD MOMENT vs % RADIUS (COND.NO.23,MAX.PWR.CLIMB,Vtrue=20 KNOTS).

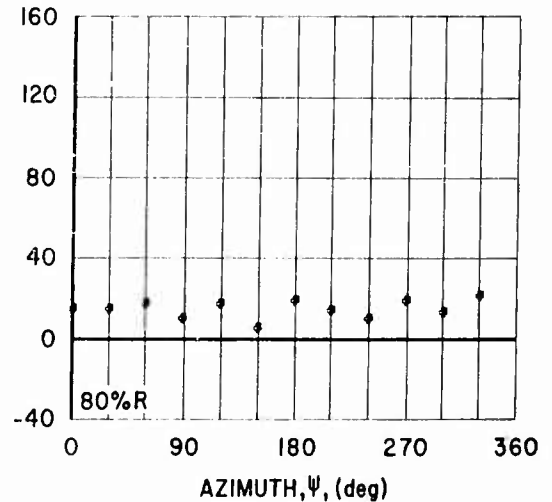
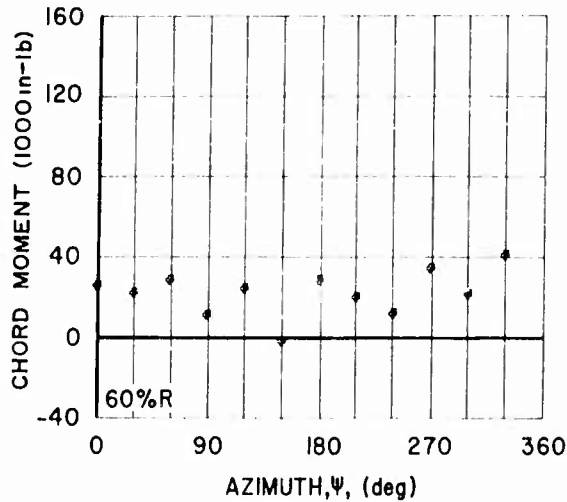
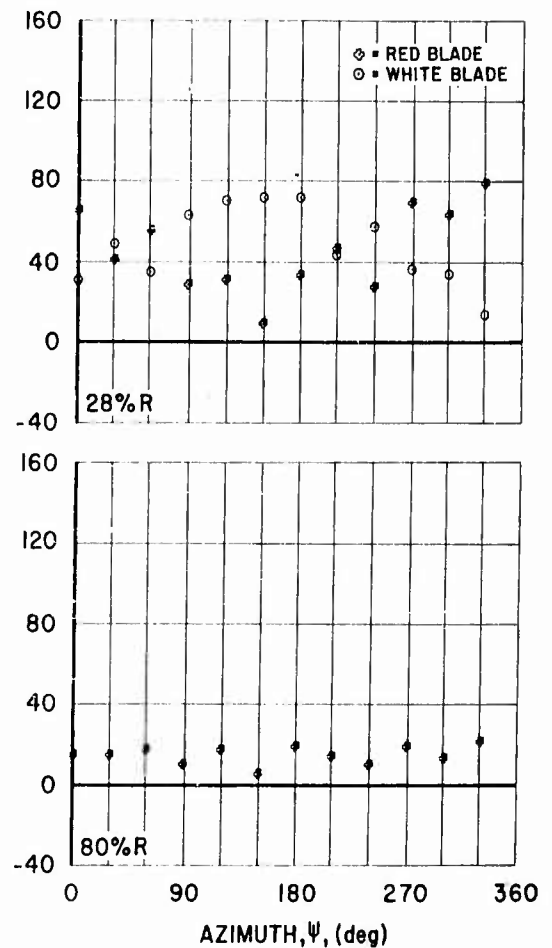
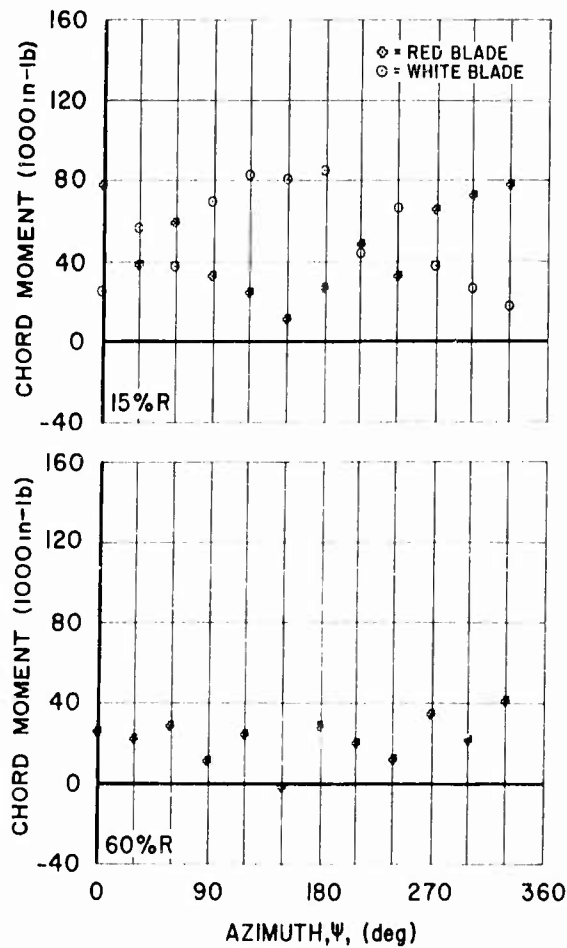


Figure 31n - CHORD MOMENT vs AZIMUTH (COND.NO.23, MAX.PWR.CLIMB,  $V_{true}=20$  KNOTS).

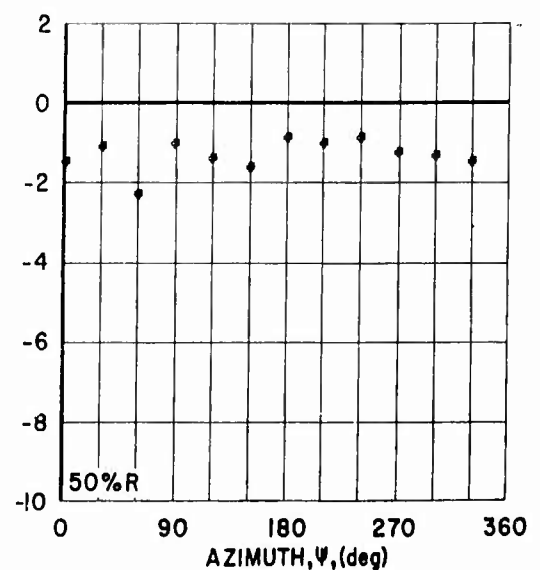
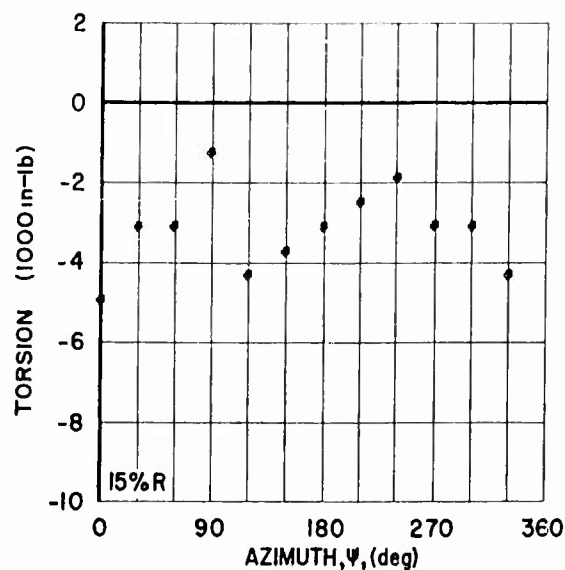


Figure 31o - TORSION vs AZIMUTH (COND.NO.23, MAX.PWR.CLIMB,  $V_{true}=20$  KNOTS).

FIGURE 32, GRAPHICAL DATA

TYPE I CONDITION NO. 27

LEVEL FLIGHT, TRUE AIRSPEED = 34 KNOTS

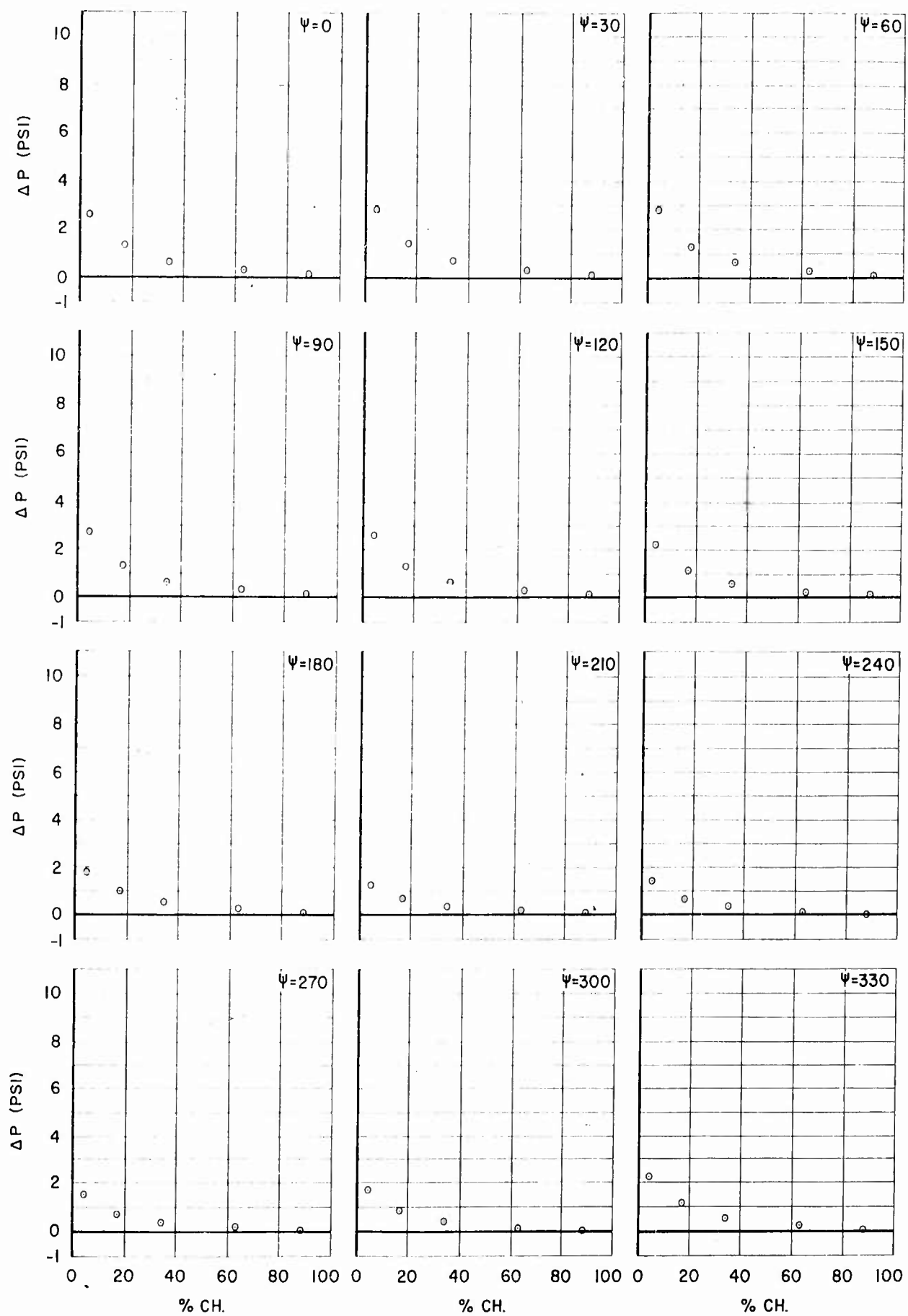


Figure 32a  $-\Delta P$  vs % CHORD (40% R, COND. NO. 27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS).

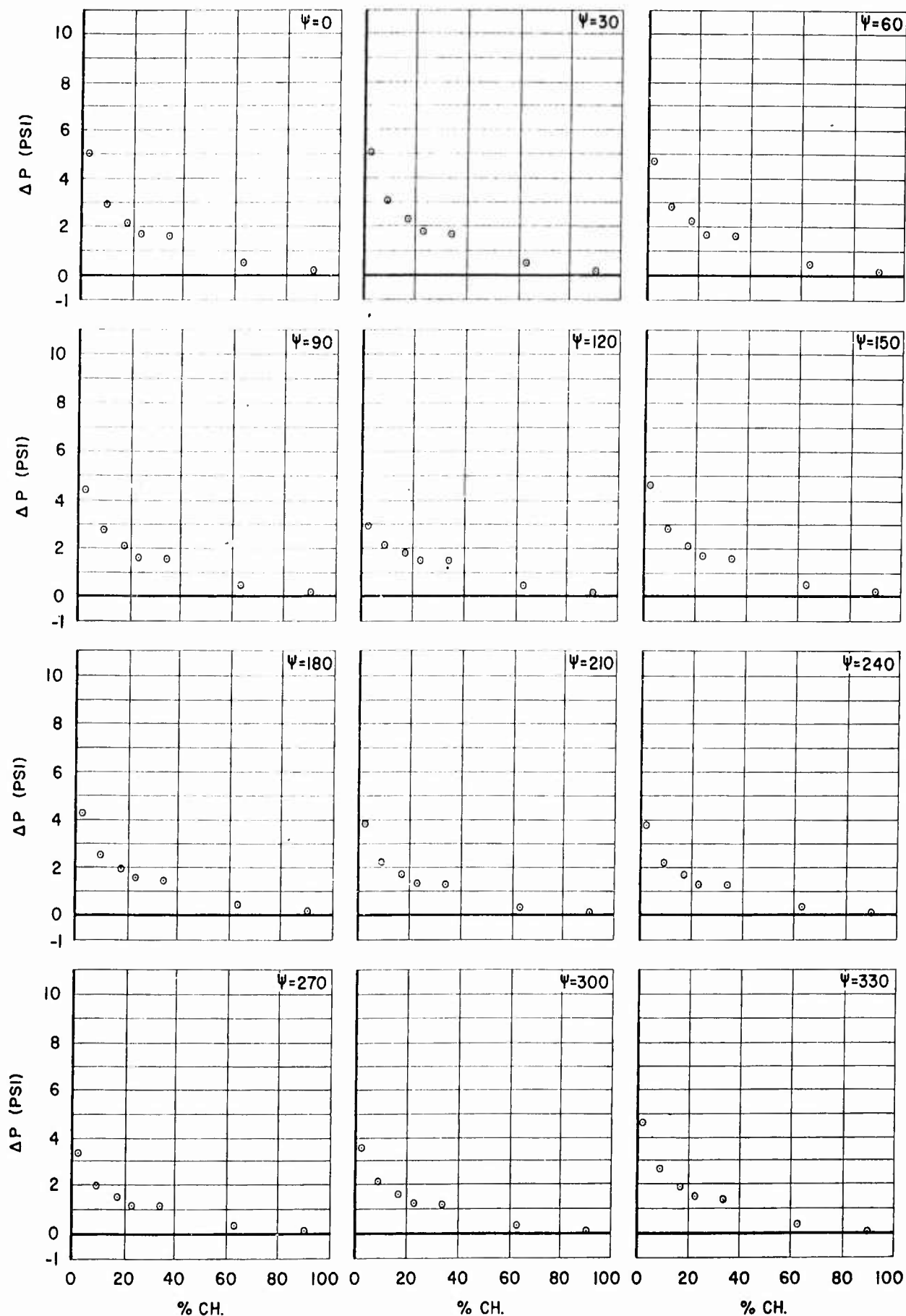


Figure 32b  $-\Delta P$  vs % CHORD (55% R, COND.NO.27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS).

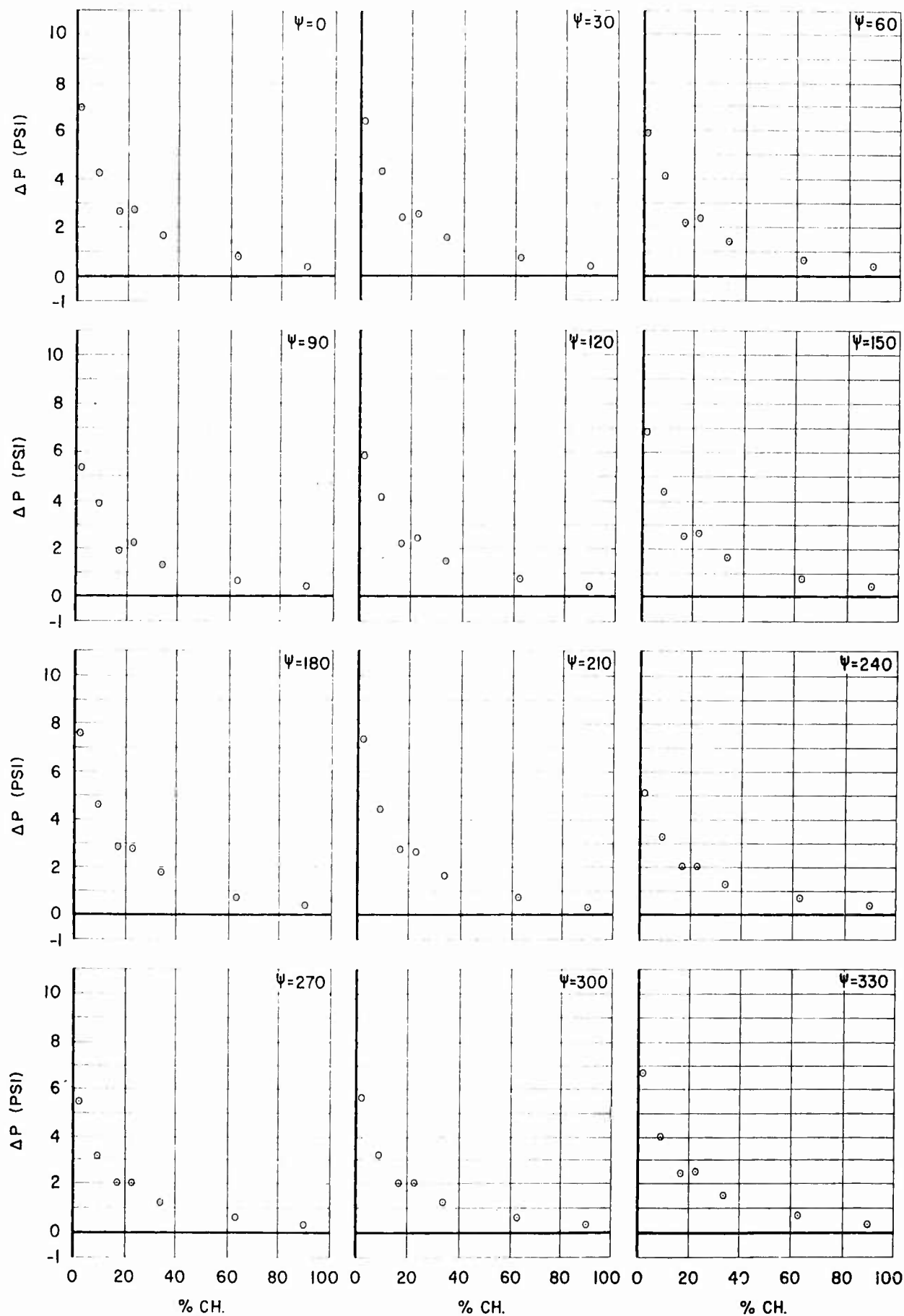


Figure 32c  $-\Delta P$  vs % CHORD (75% R, COND.NO. 27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS).

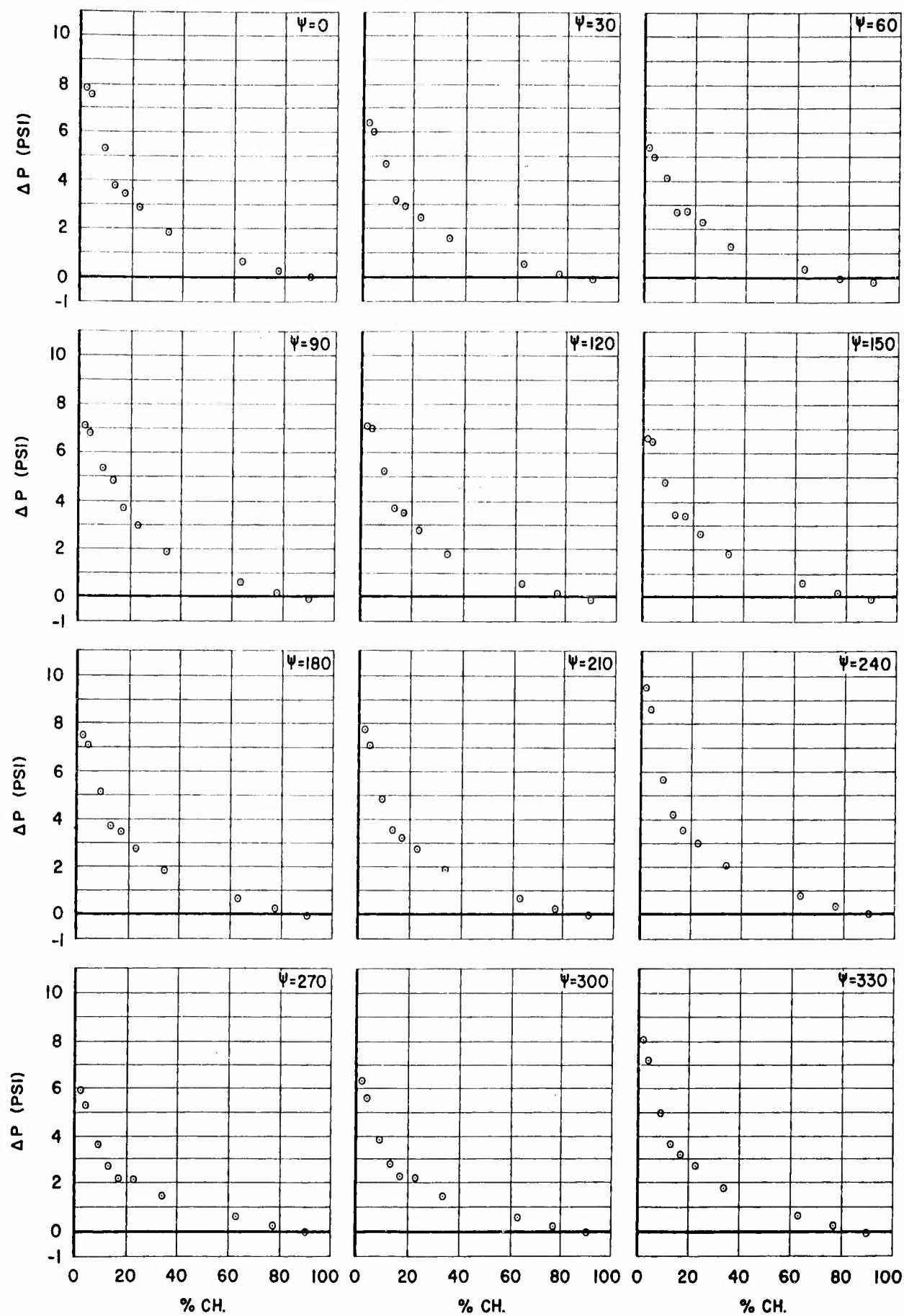


Figure 32d  $-\Delta P$  vs % CHORD (85% R, COND.NO.27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS).

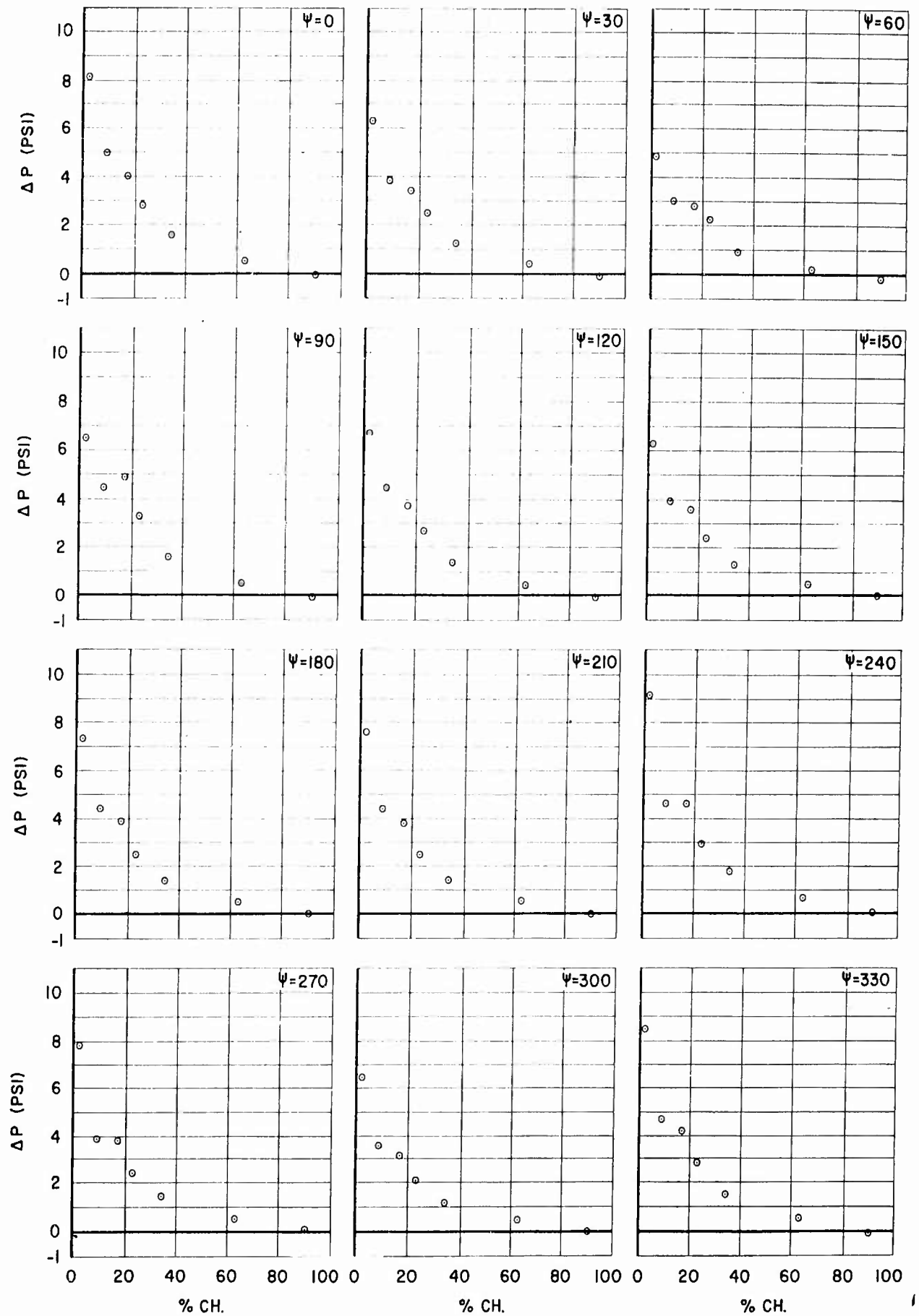


Figure 32e  $\Delta P$  vs % CHORD (90% R, COND.NO.27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS).



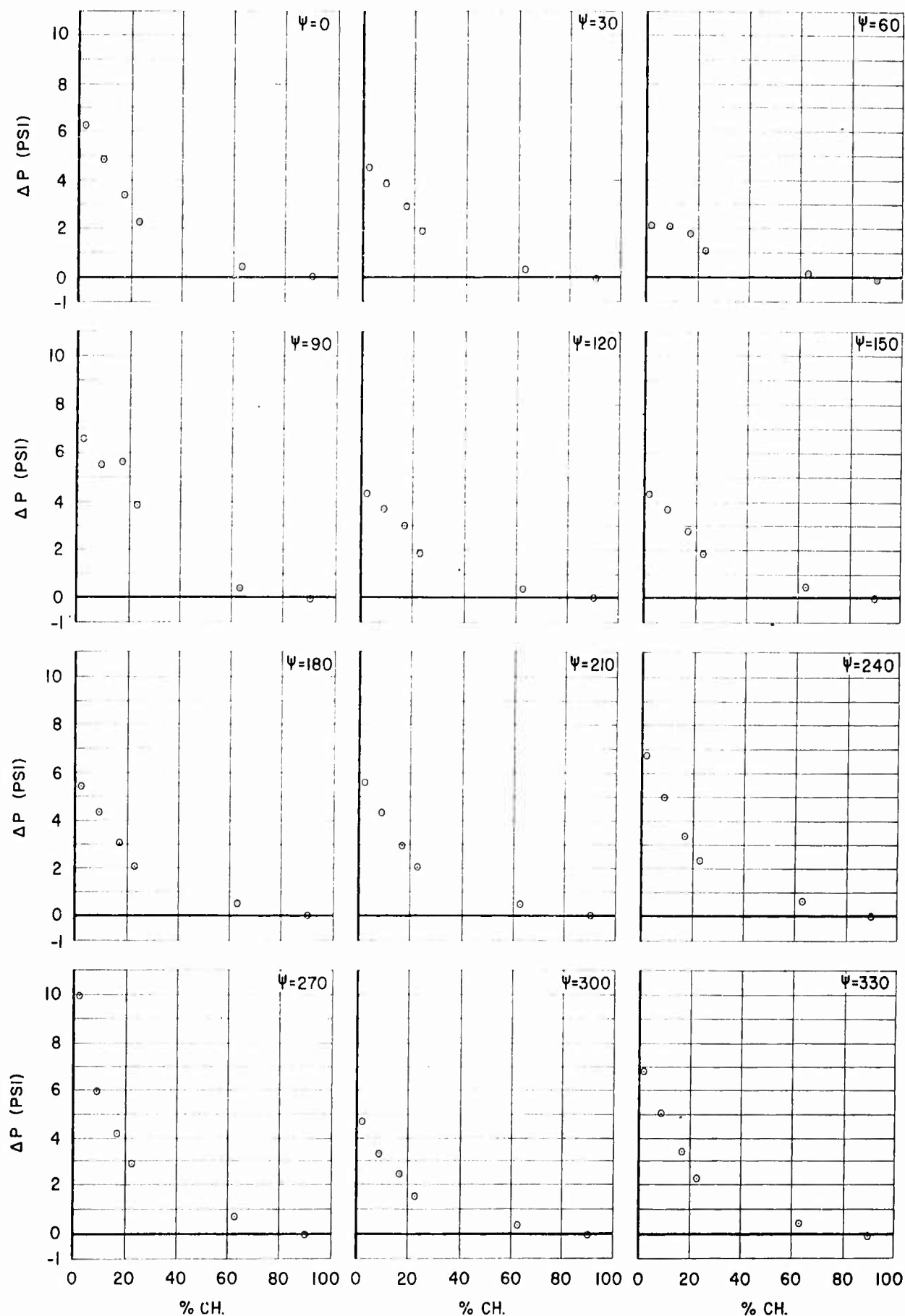


Figure 32f  $-\Delta P$  vs % CHORD (95% R, COND.NO.27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS).

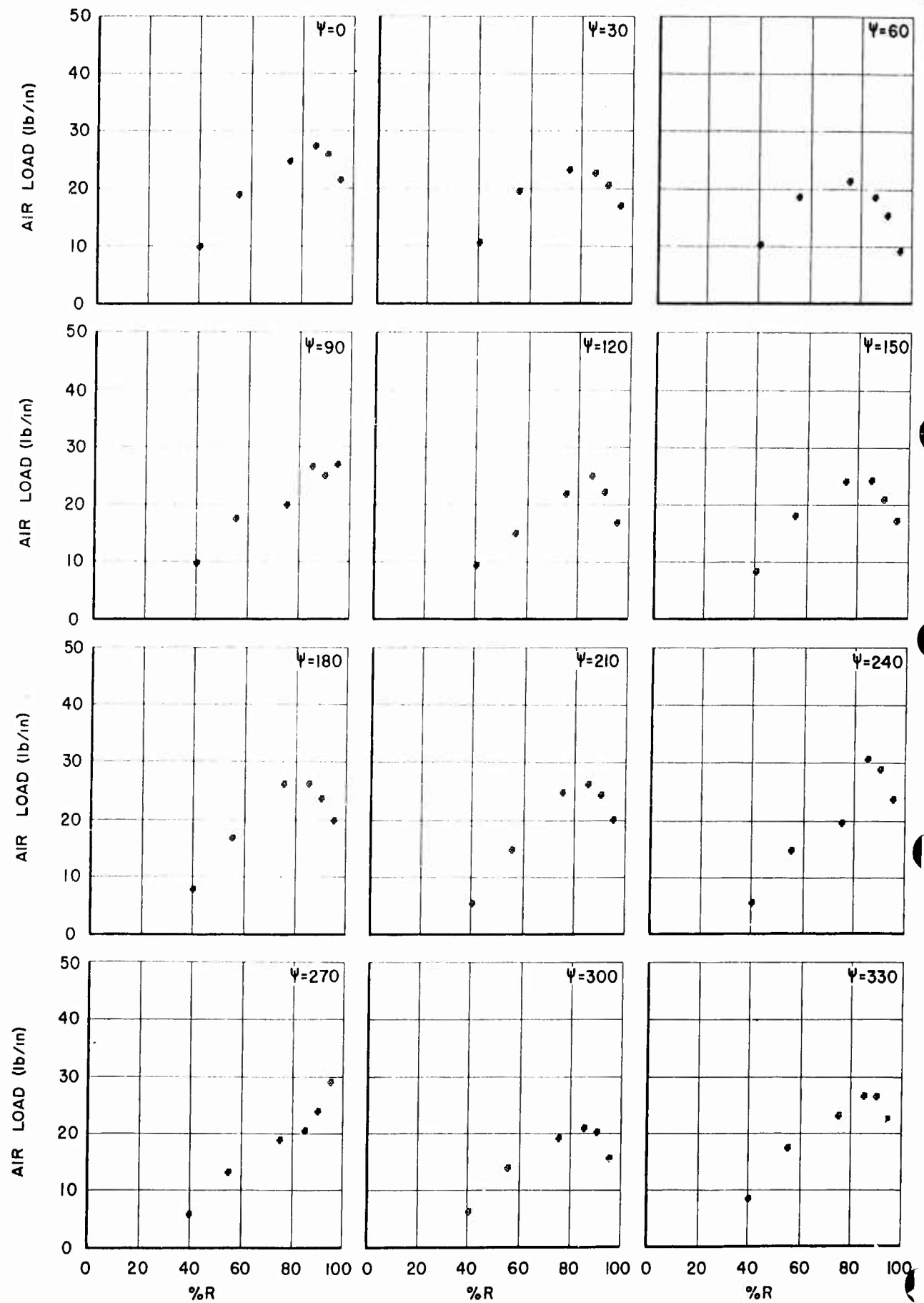


Figure 32g - AIR LOAD vs % RADIUS (COND.NO.27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS).

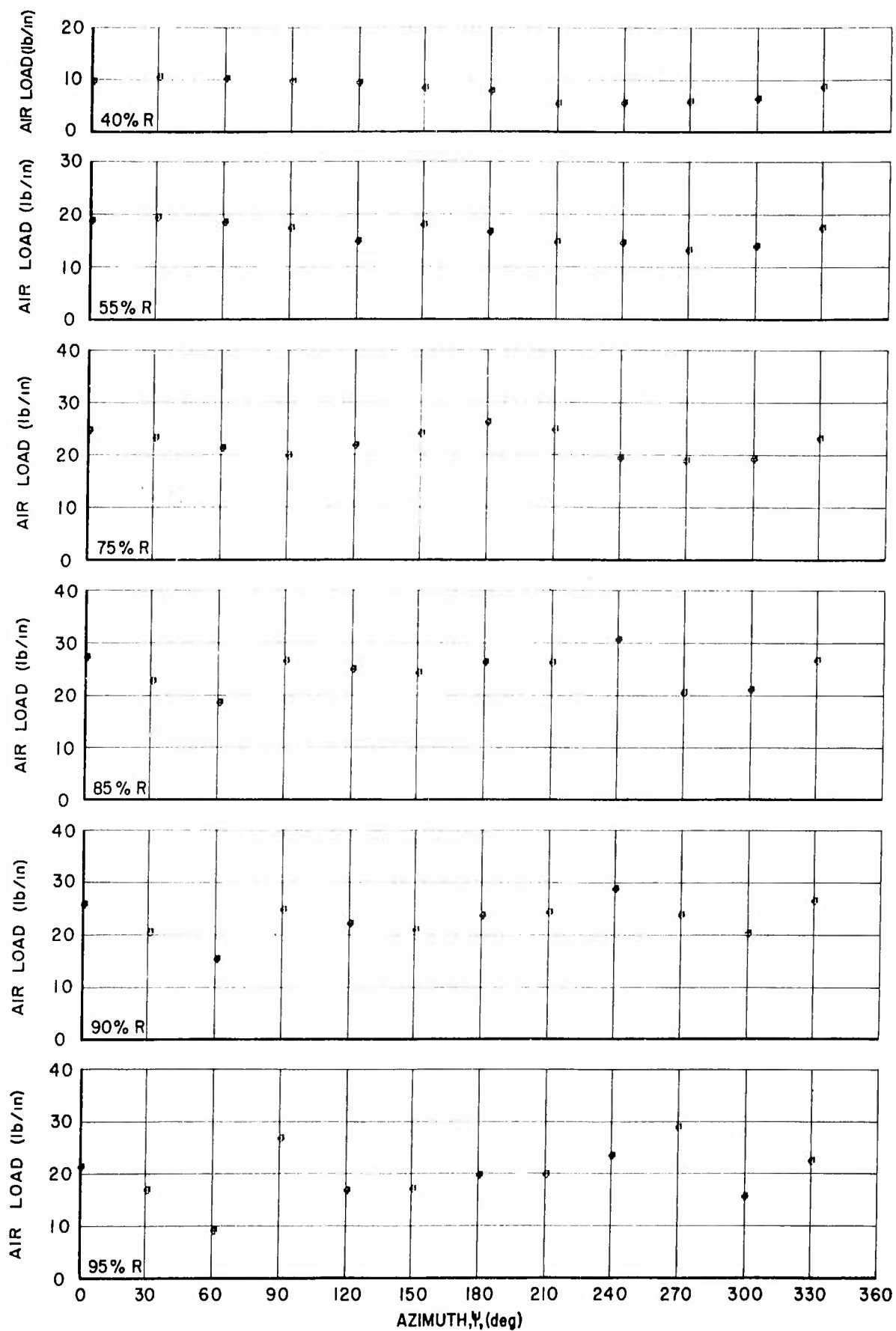


Figure 32h - AIR LOAD vs AZIMUTH (COND.NO.27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS).

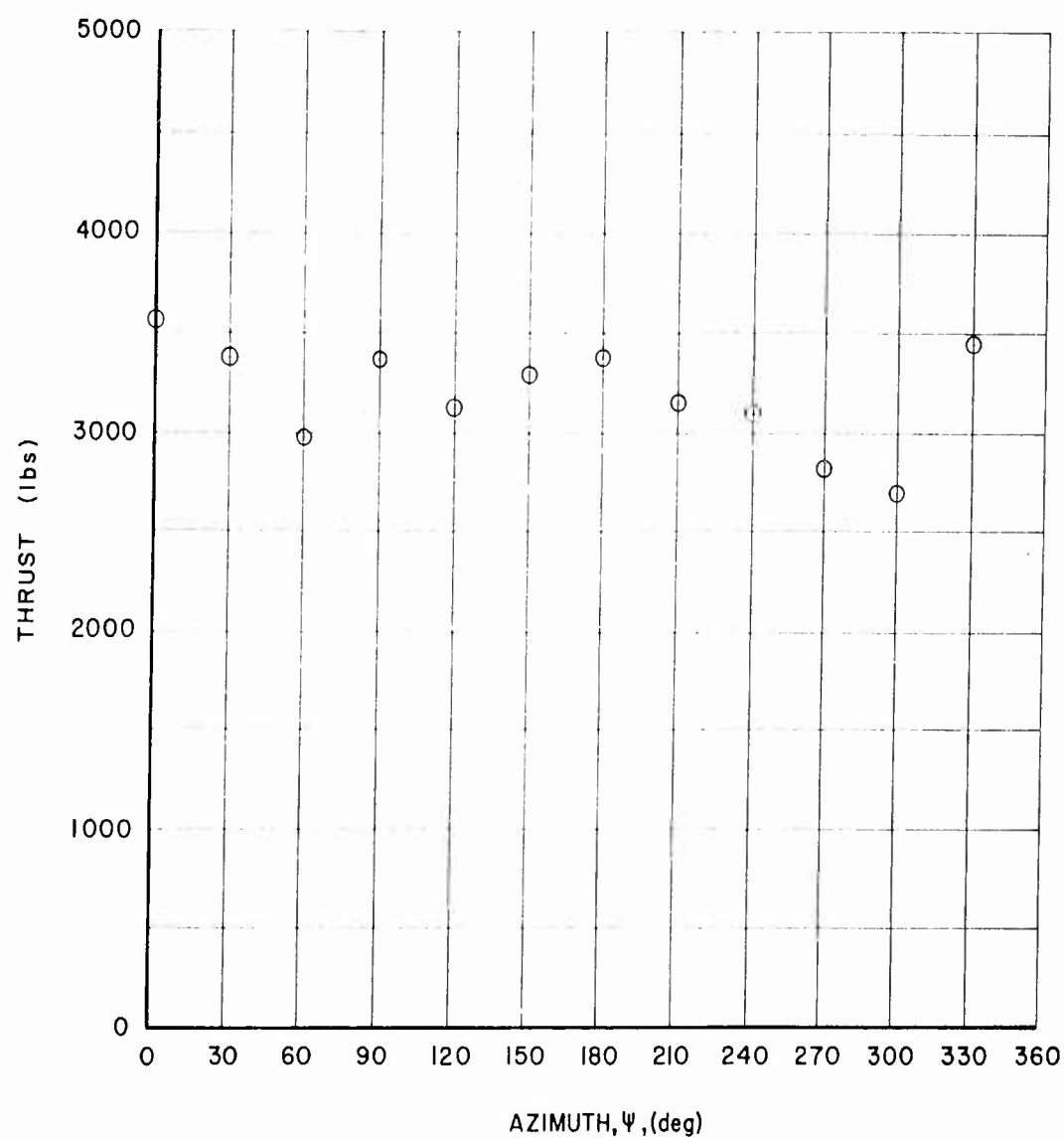


Figure 32i TOTAL THRUST/BLADE vs AZIMUTH  
(COND.NO.27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS).

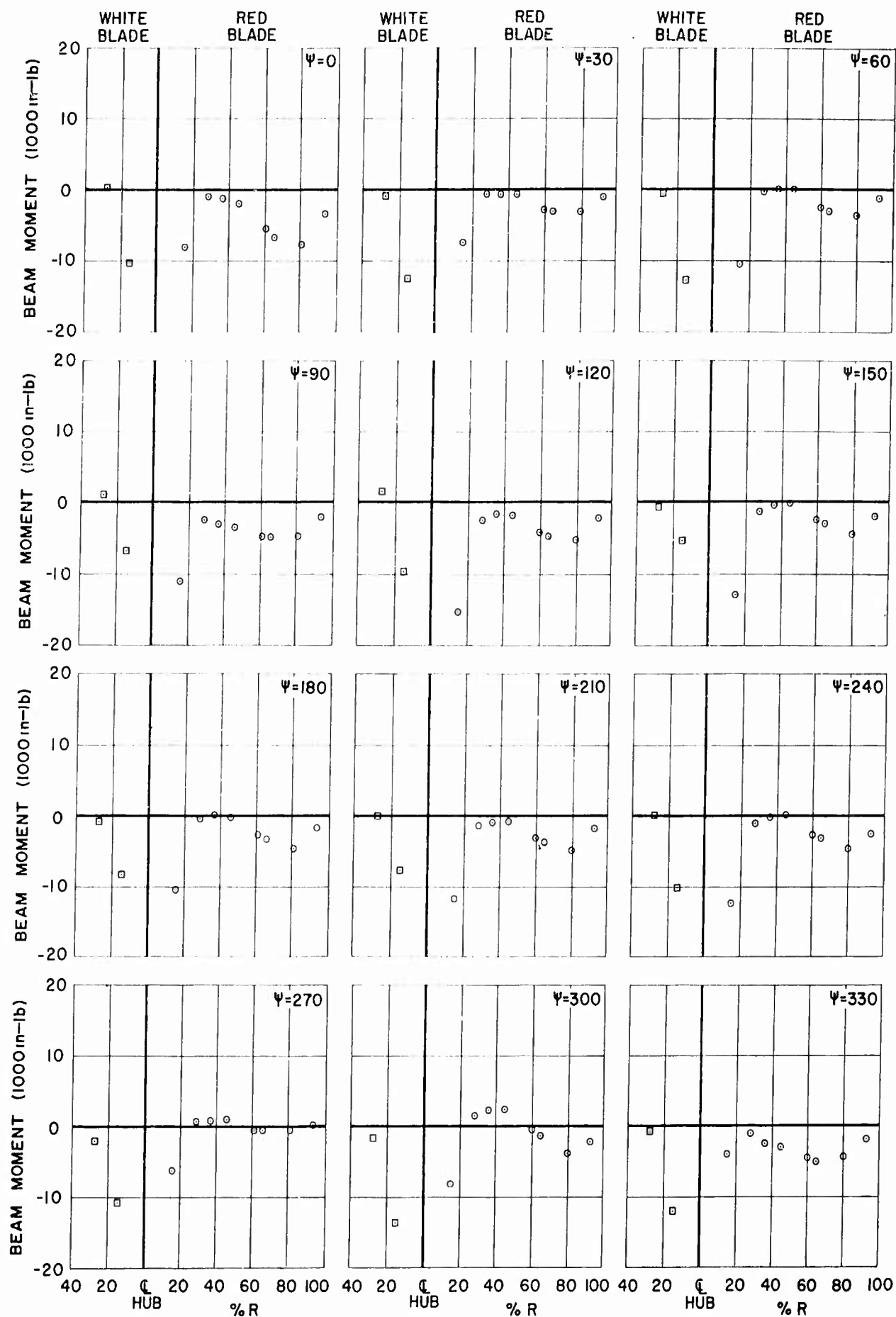


Figure 32j. - BEAM MOMENT vs % RADIUS (COND.NO.27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS).

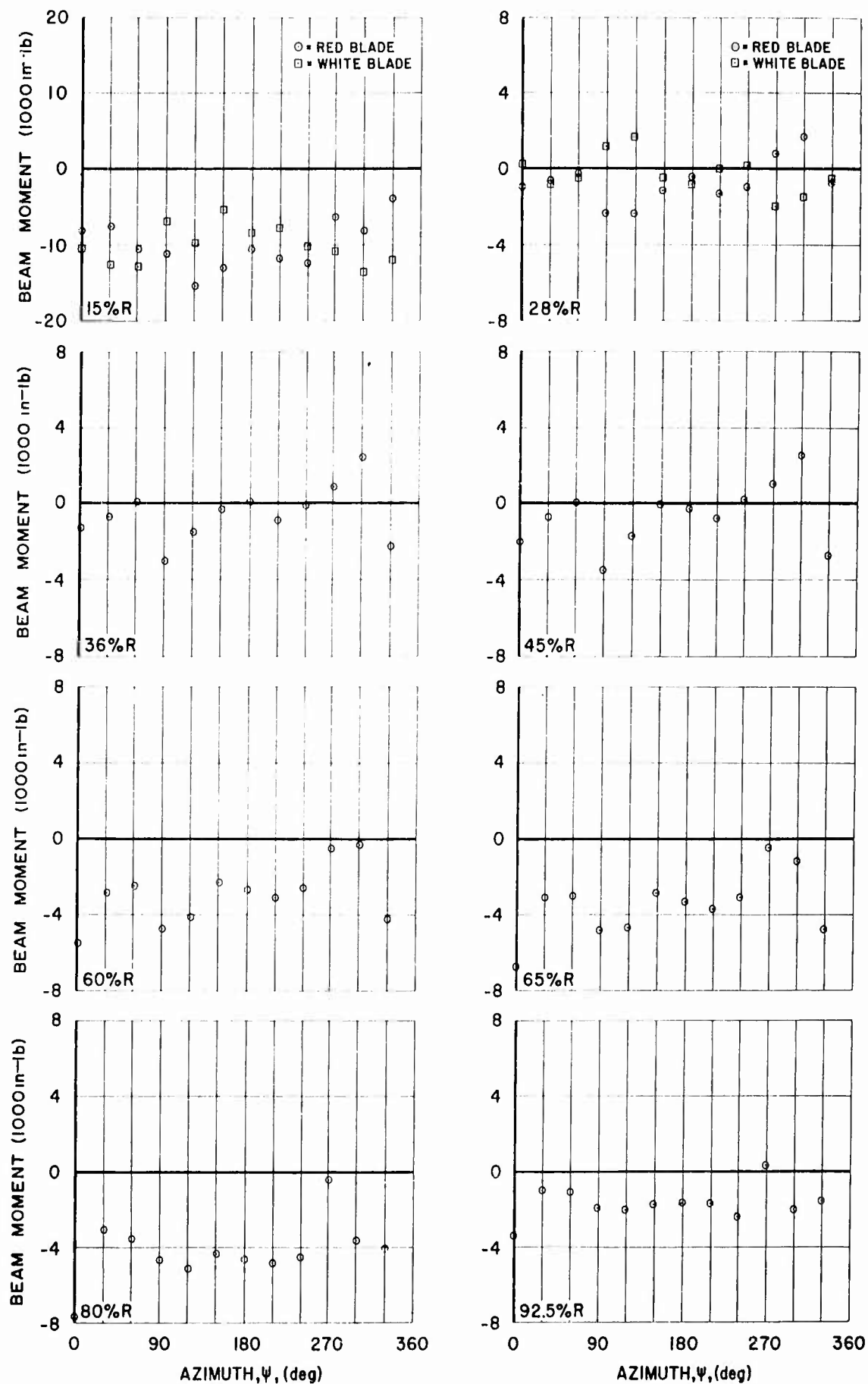


Figure 32k - BEAM MOMENT vs AZIMUTH (COND.NO.27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS).

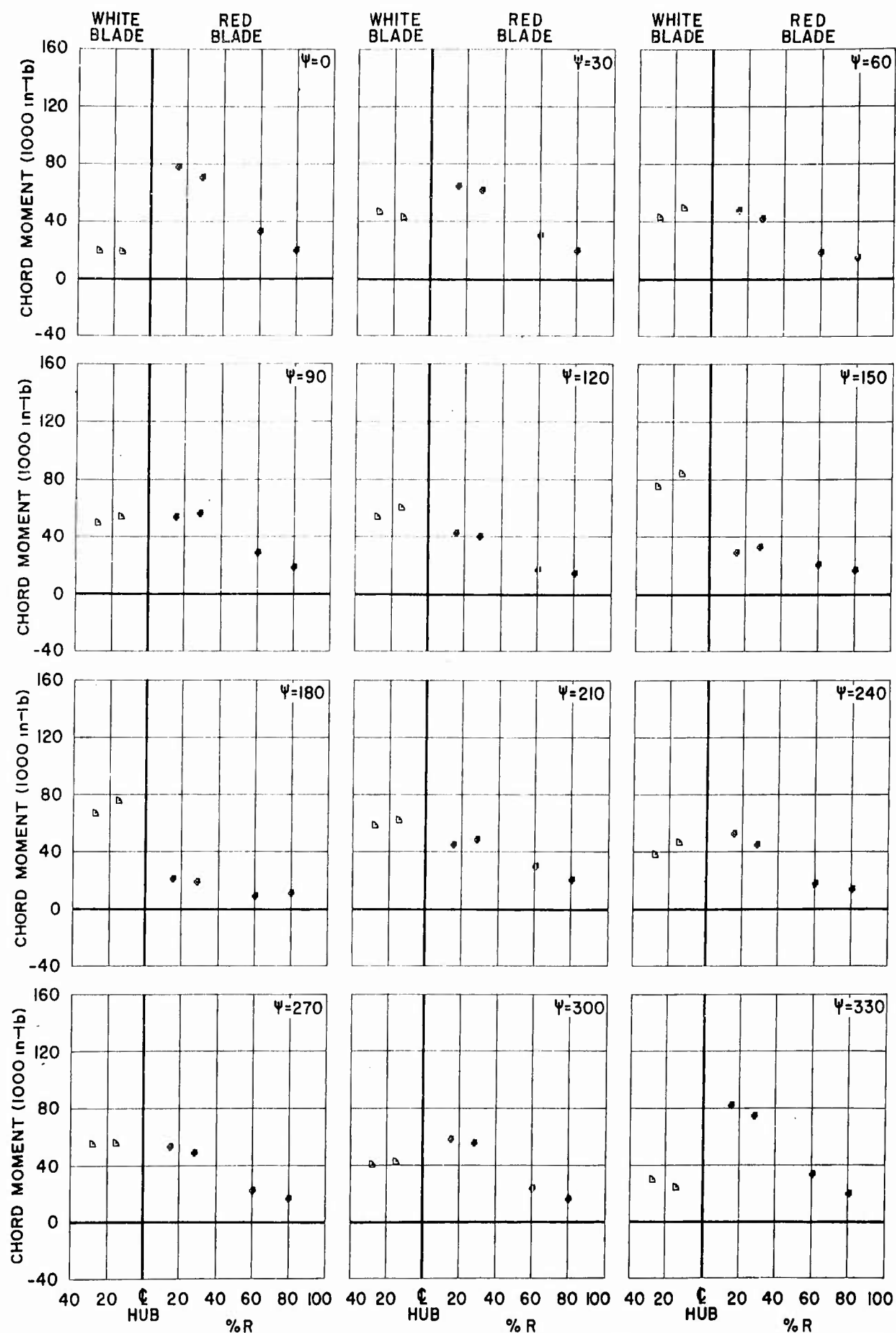


Figure 32m - CHORD MOMENT vs % RADIUS (COND.NO.27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS).

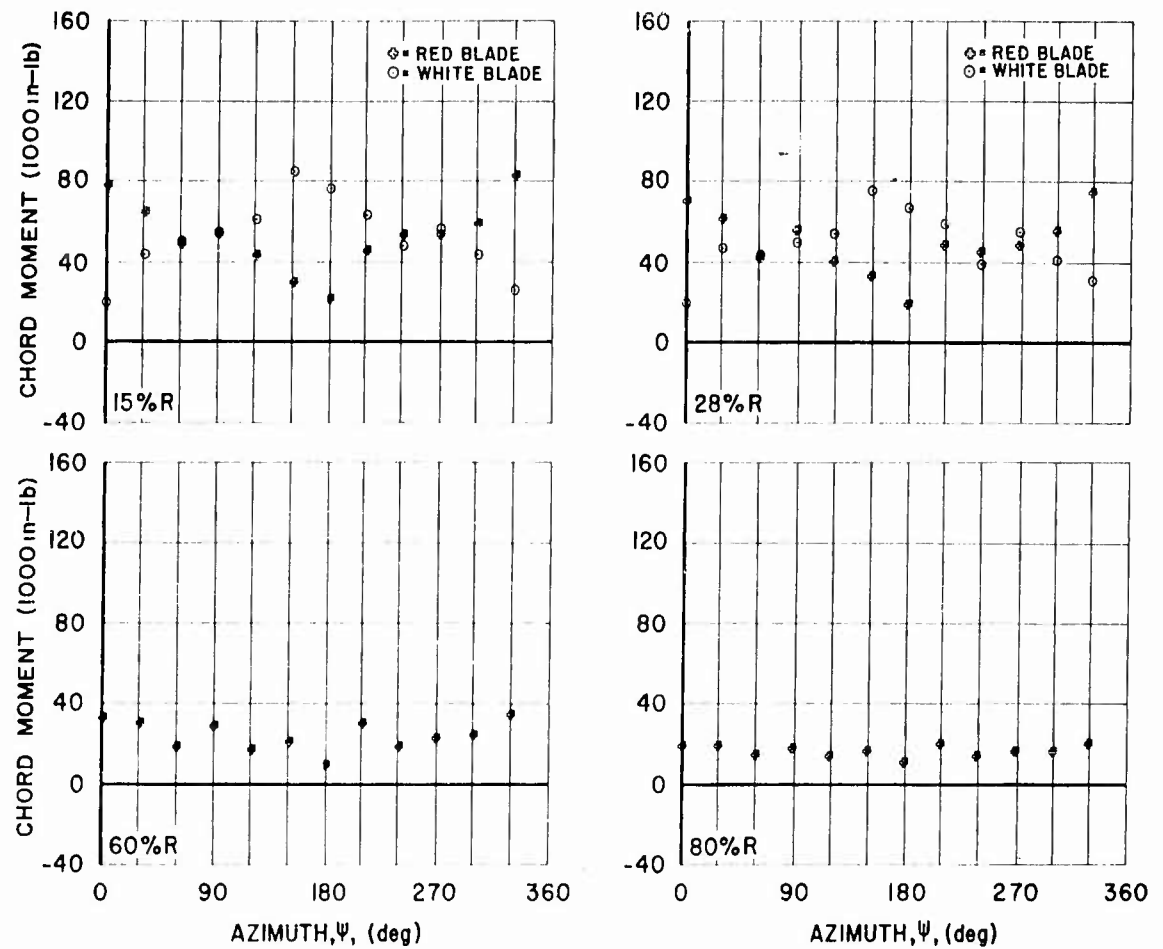


Figure 32n - CHORD MOMENT vs AZIMUTH (COND.NO.27, LEVEL FLIGHT,  $V_{true}=34$  KNOTS)

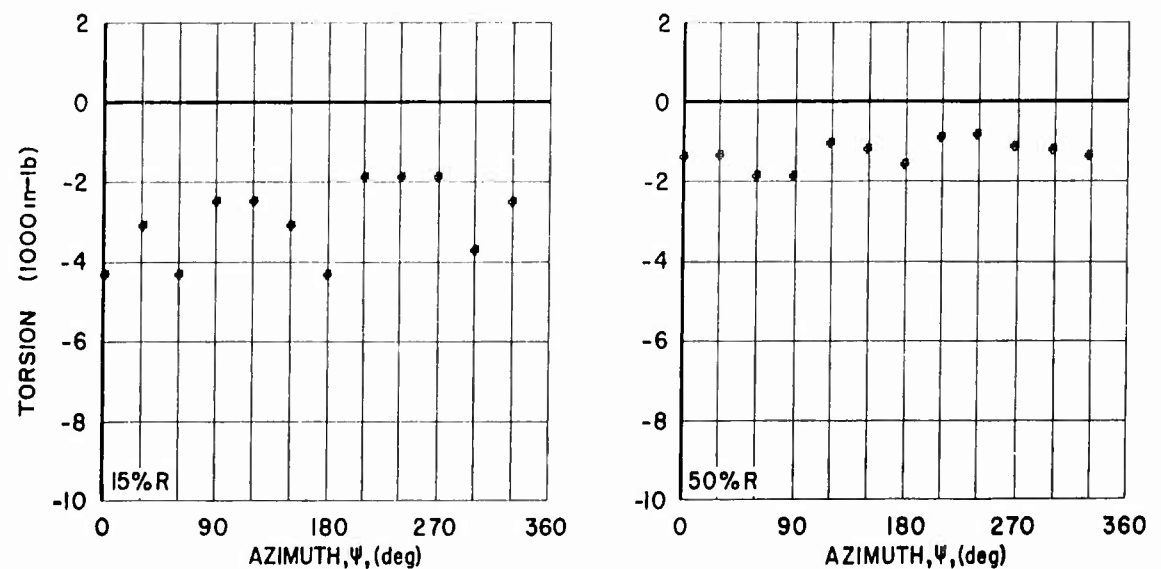


Figure 32o - TORSION vs AZIMUTH (COND.NO.27, LEVEL FLIGHT,  $V_{true} = 34$  KNOTS)



FIGURE 33, GRAPHICAL DATA

TYPE I CONDITION NO. 29

LEVEL FLIGHT, TRUE AIRSPEED = 88 KNOTS

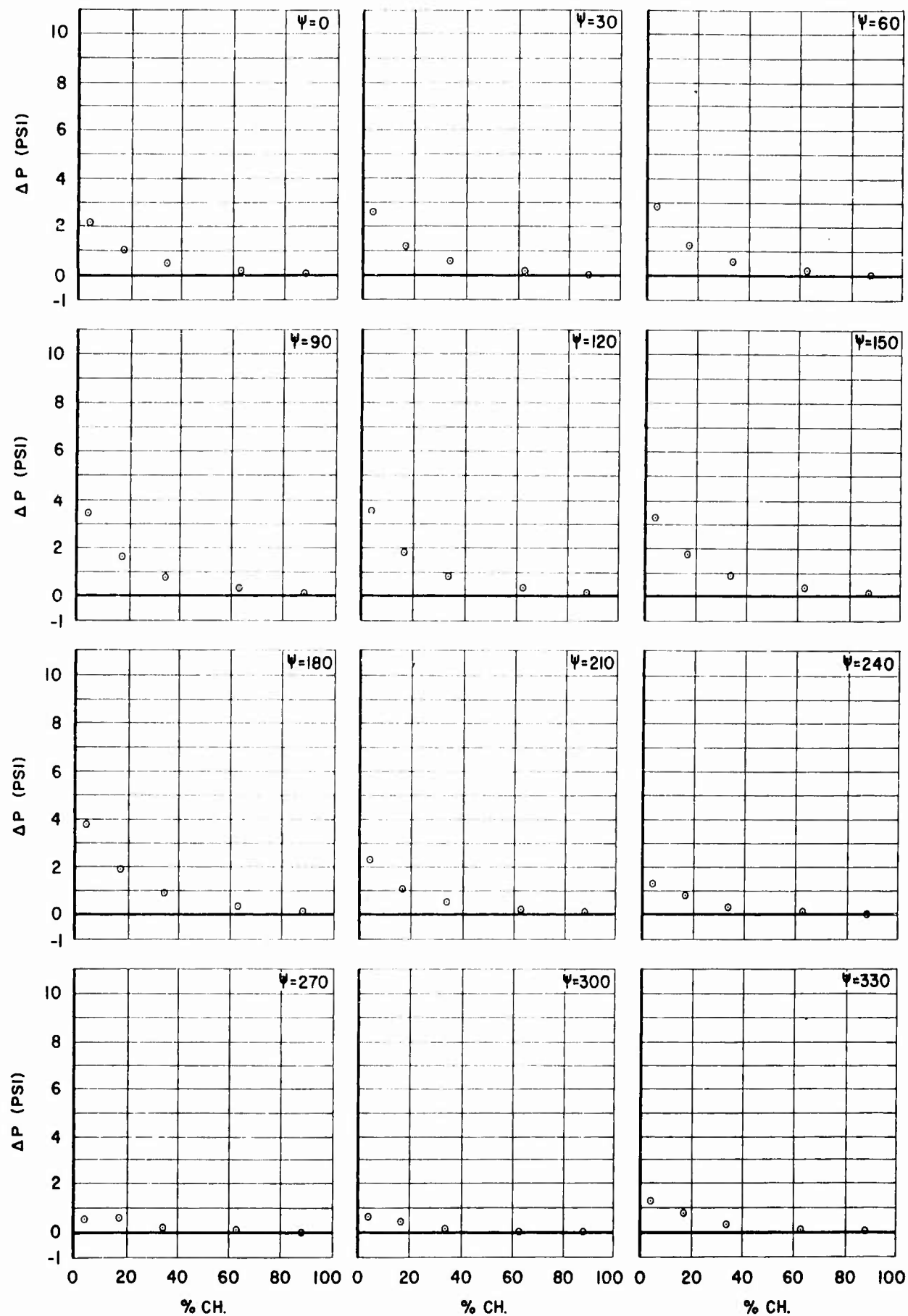


Figure 33a  $-\Delta P$  vs % CHORD (40% R, COND.NO.29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS).

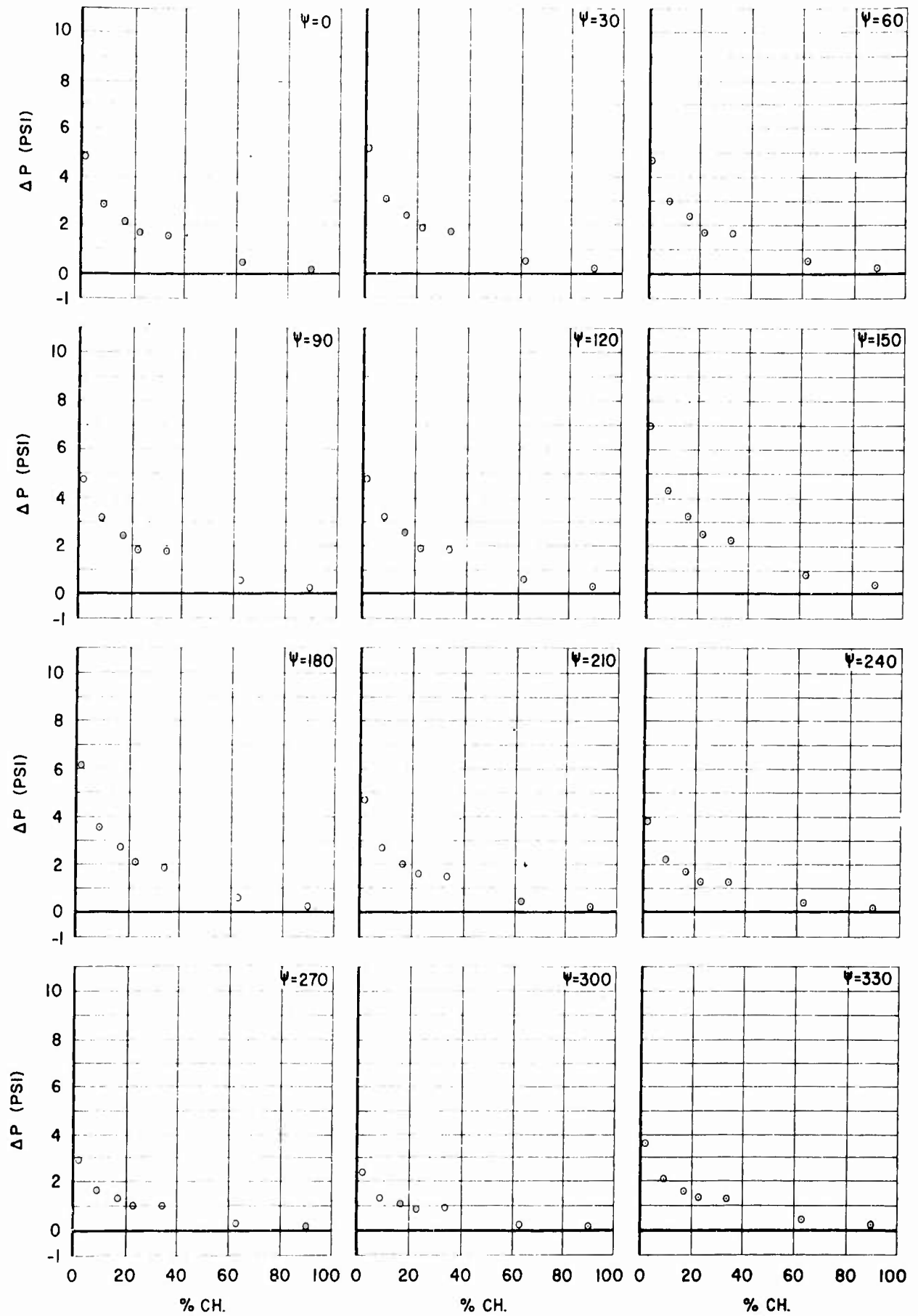


Figure 33b  $-\Delta P$  vs % CHORD (55% R, COND.NO.29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS).

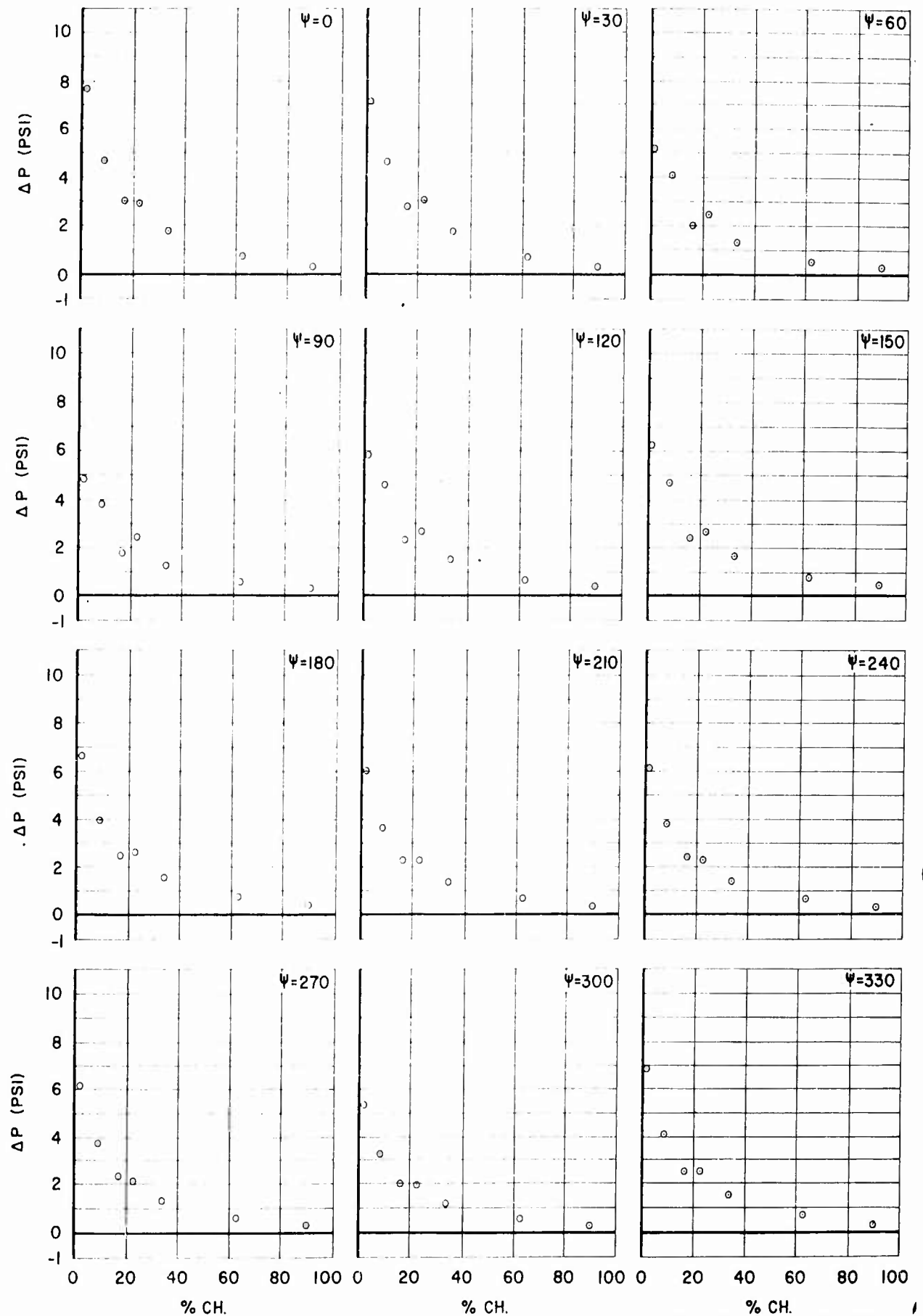


Figure 33c -  $\Delta P$  vs % CHORD (75% R, COND.NO.29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS).

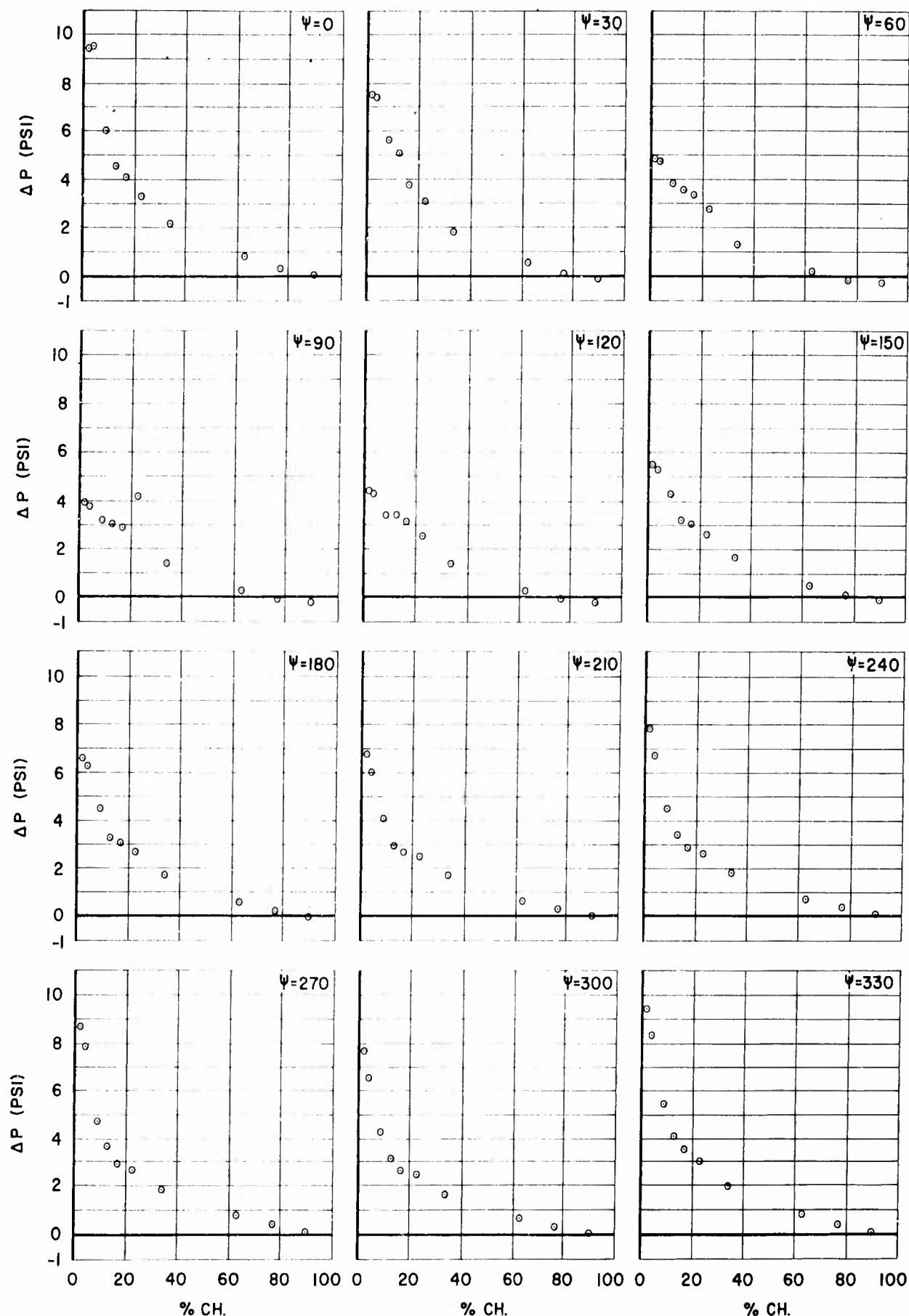


Figure 33d  $-\Delta P$  vs % CHORD (85% R, COND.NO.29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS).

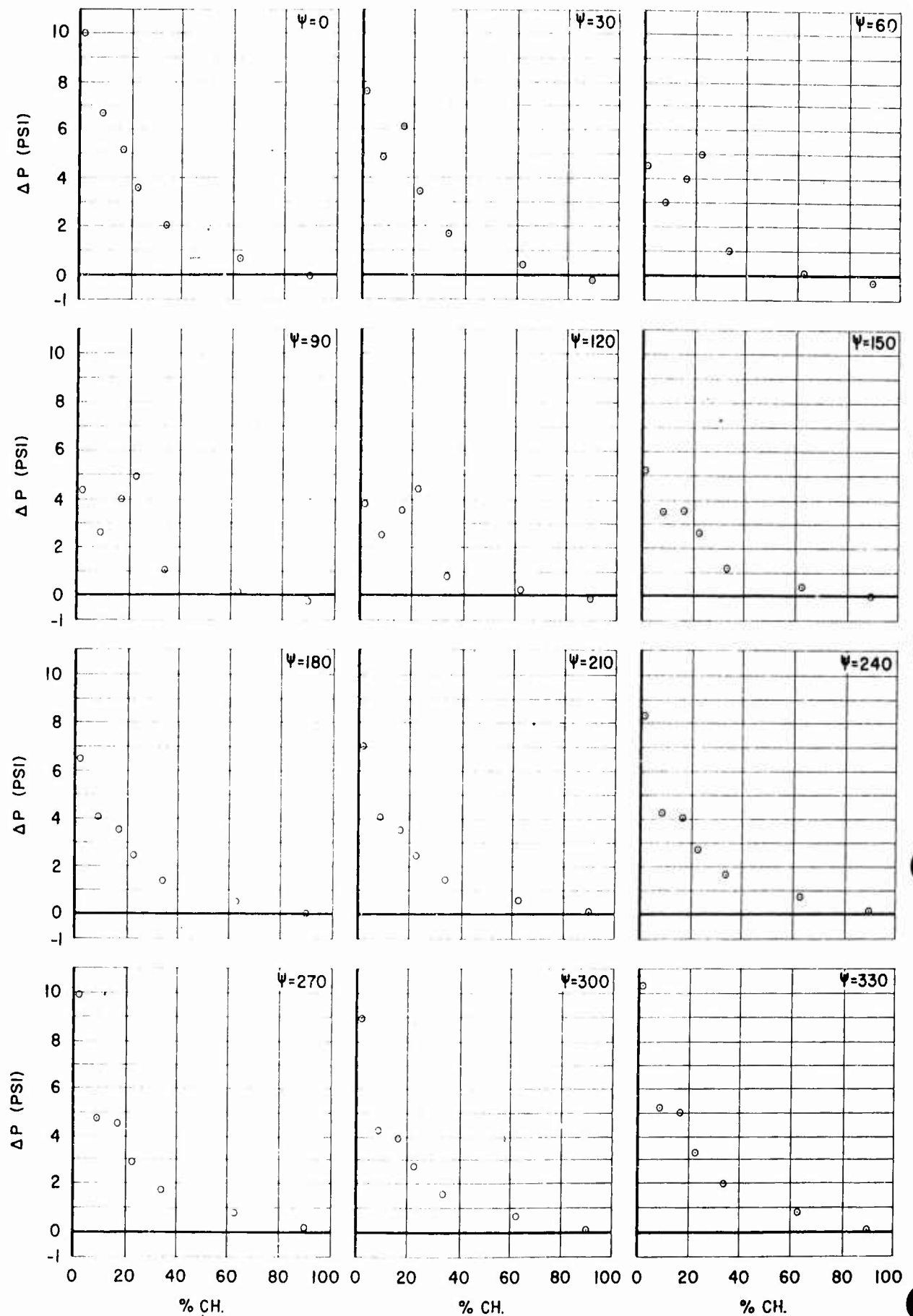


Figure 33e  $\Delta P$  vs % CHORD (90° R, COND. NO. 29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS.)

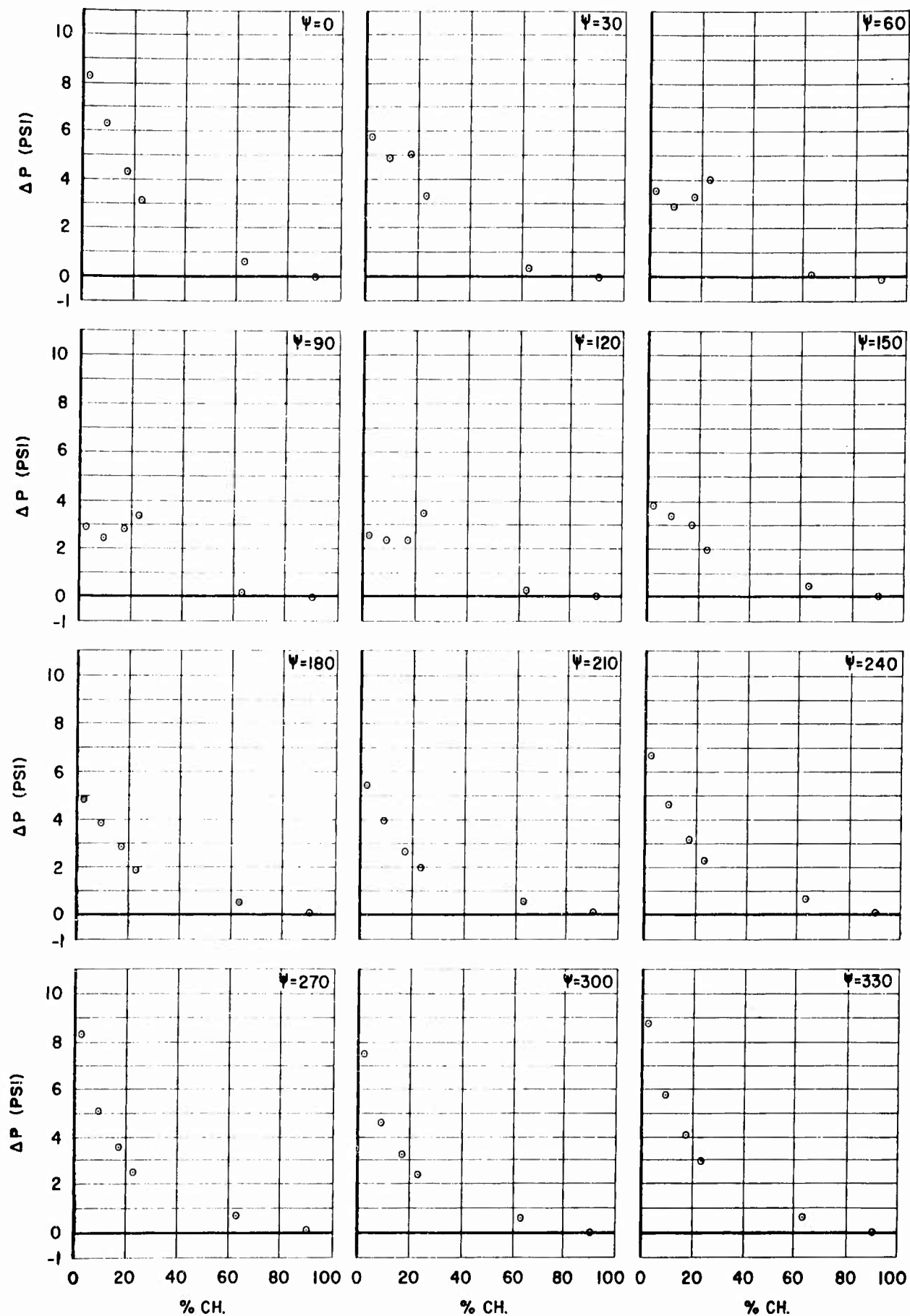


Figure 33f  $-\Delta P$  vs % CHORD (95% R, COND. NO. 29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS).

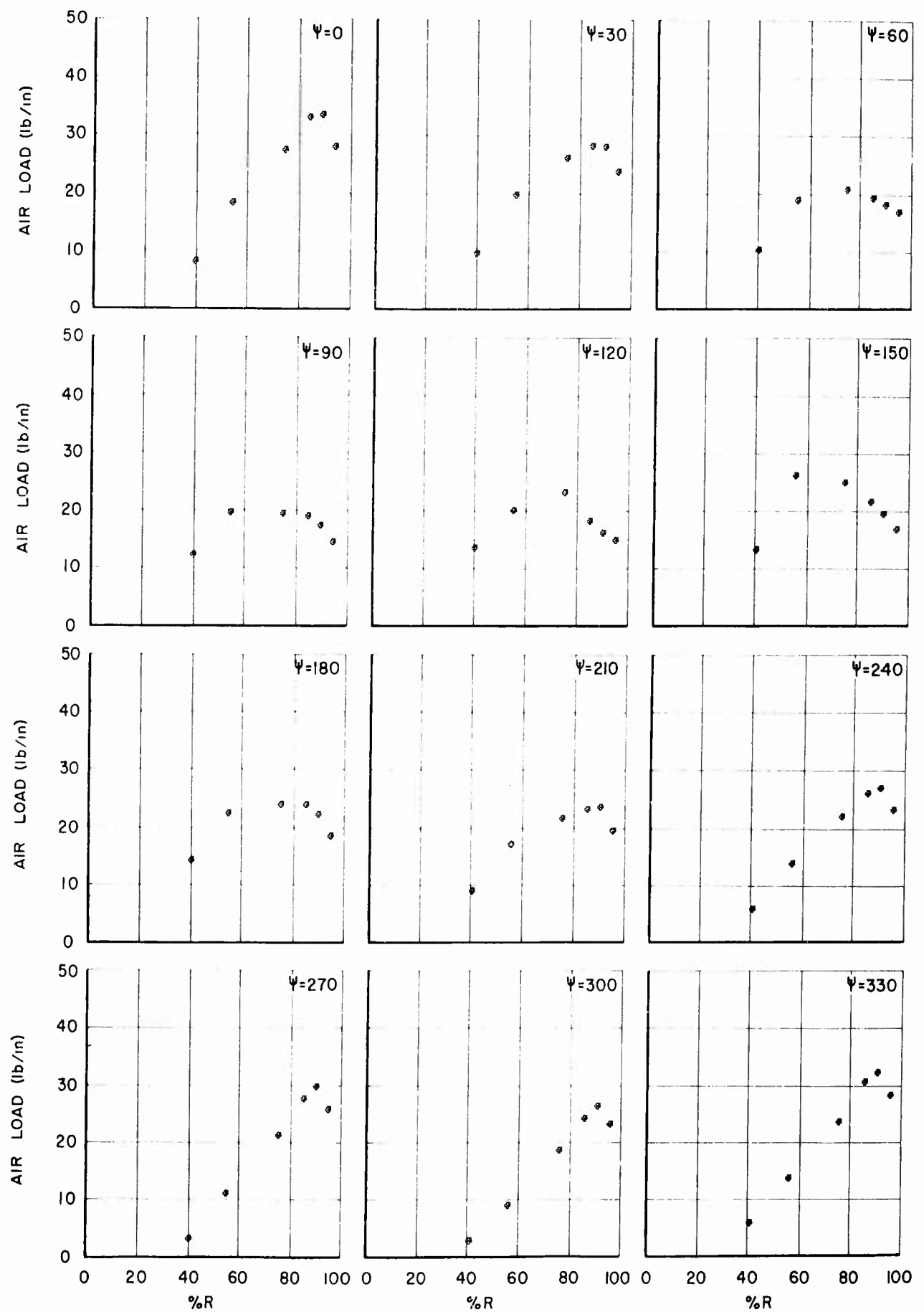


Figure 33g - AIR LOAD vs % RADIUS (COND.NO.29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS).



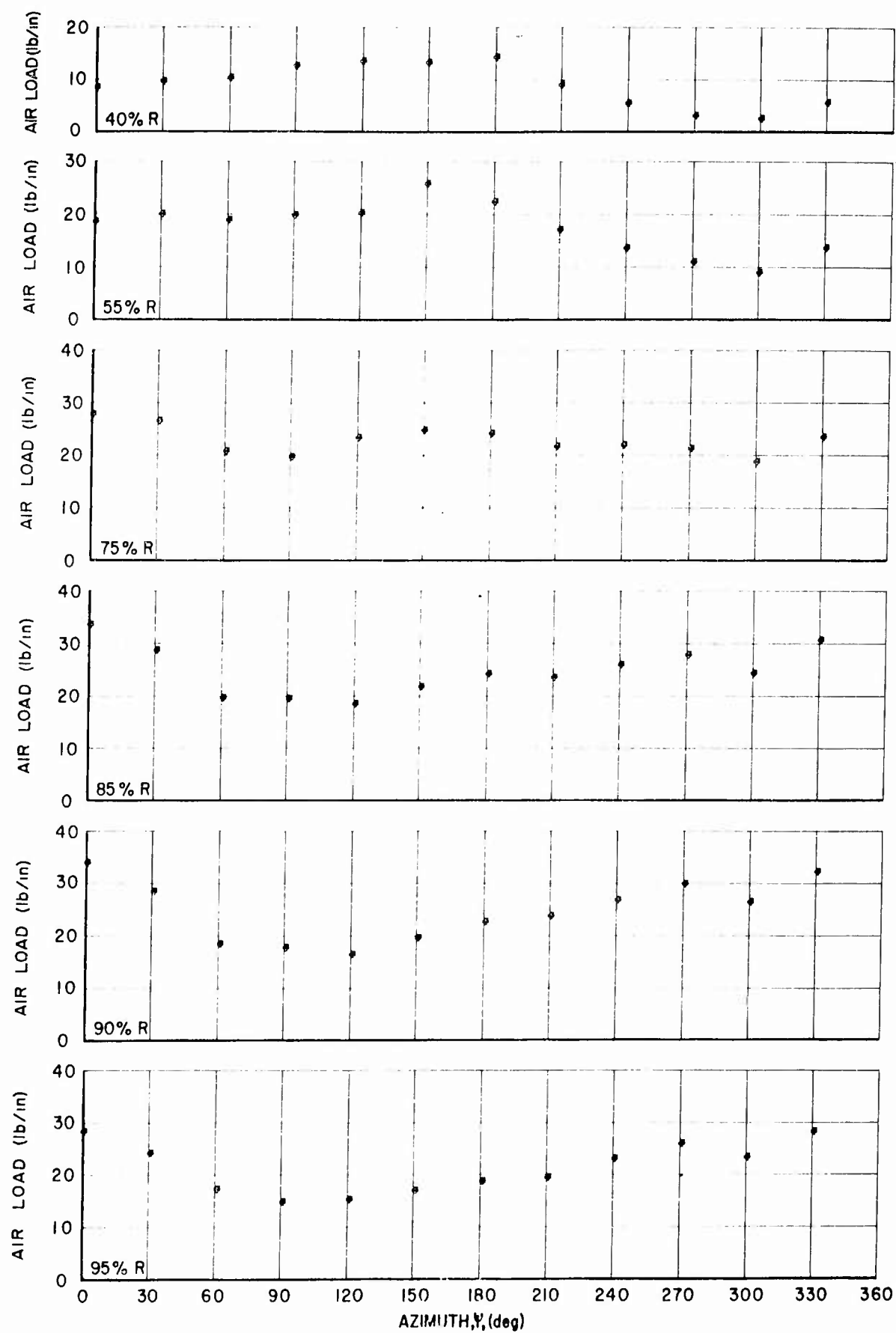


Figure 33h - AIR LOAD vs AZIMUTH (COND.NO.29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS).

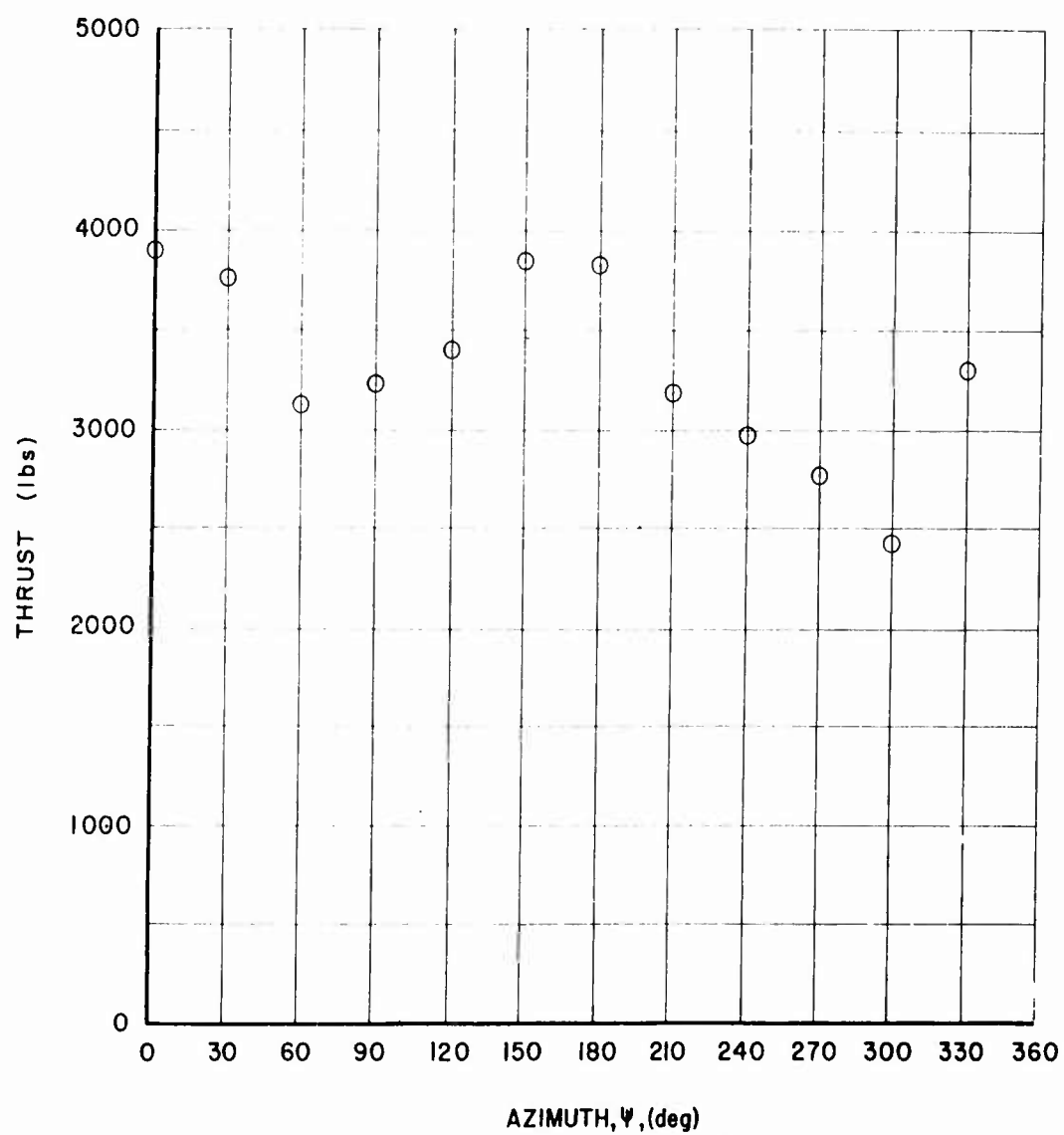


Figure 33i TOTAL THRUST/BLADE vs AZIMUTH  
(COND.NO.29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS).

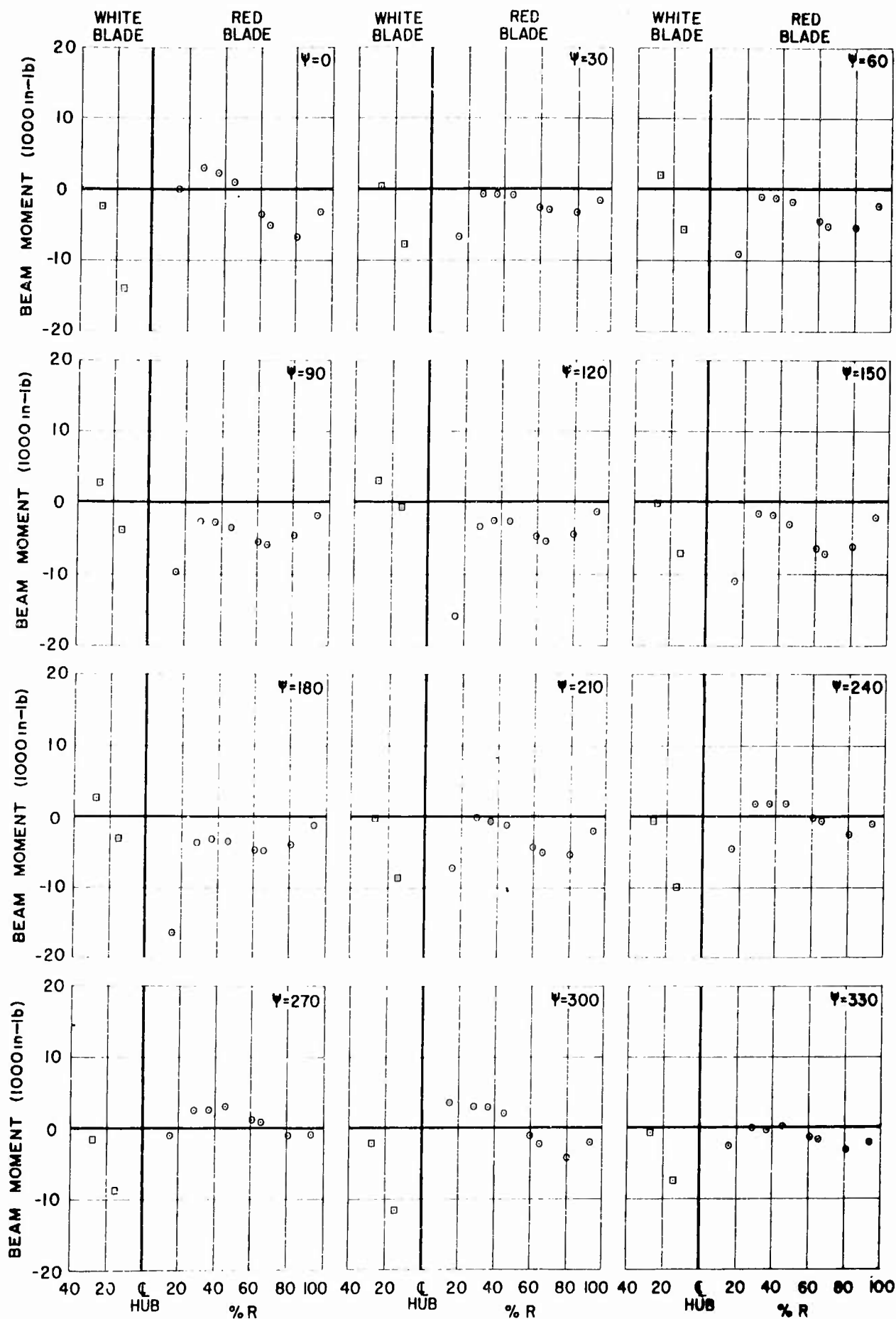


Figure 33j - BEAM MOMENT vs % RADIUS (COND.NO.29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS).

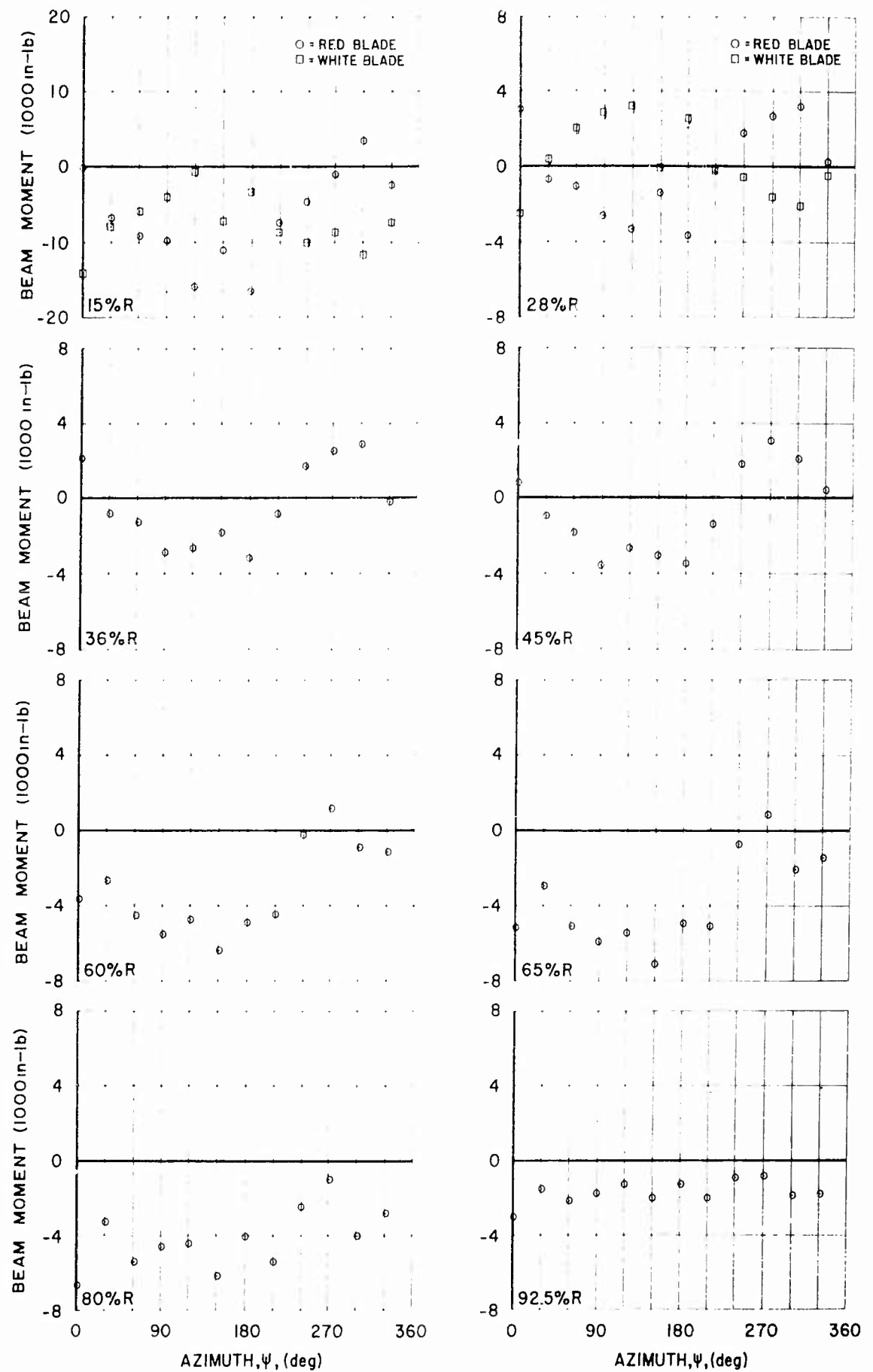


Figure 33k - BEAM MOMENT vs AZIMUTH (COND.NO.29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS).

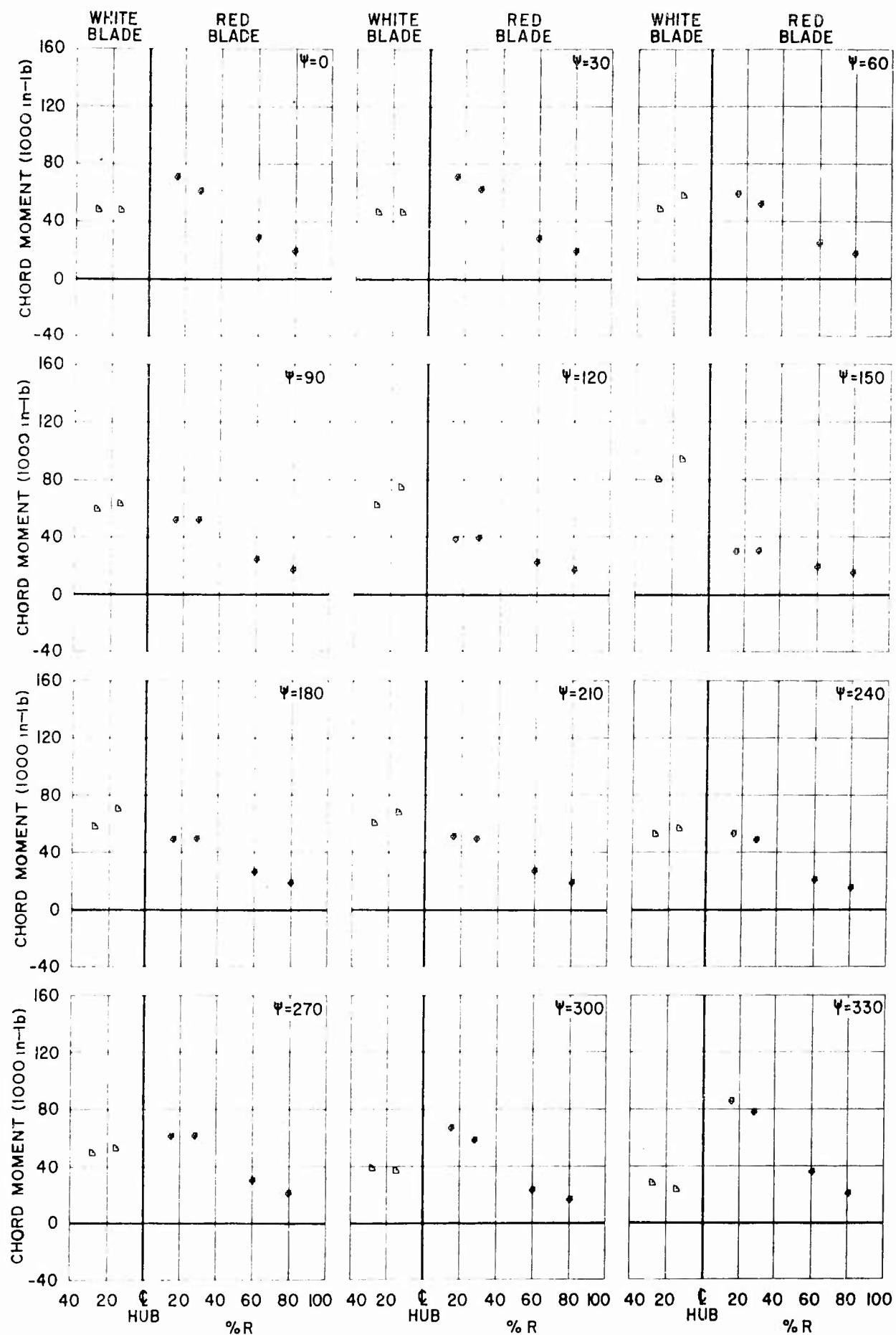


Figure 33m - CHORD MOMENT vs % RADIUS (COND.NO.29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS).

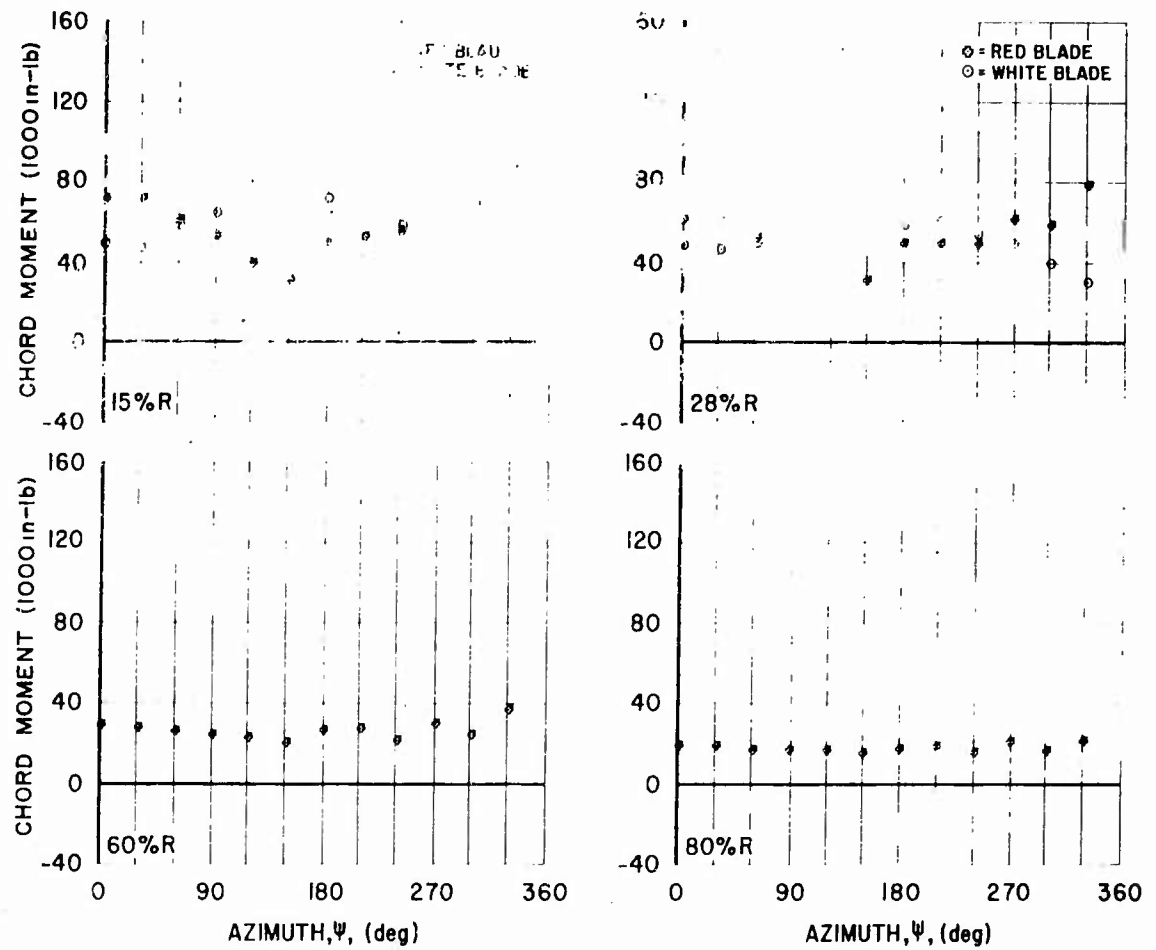


Figure 33n - CHORD MOMENT vs AZIMUTH (COND.NO.29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS)

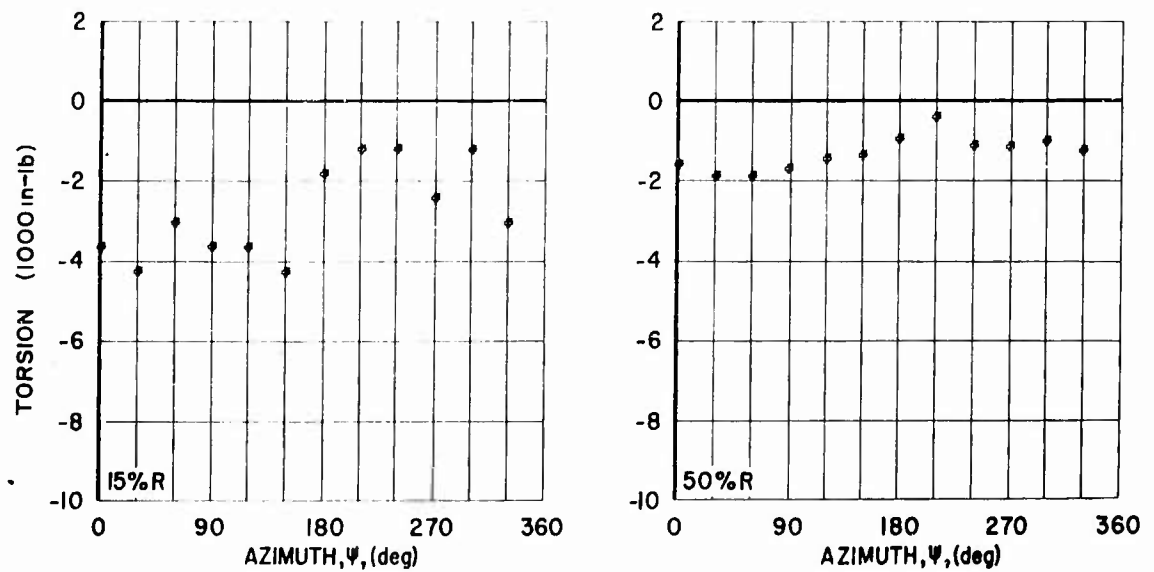


Figure 33o - TORSION vs AZIMUTH (COND.NO.29, LEVEL FLIGHT,  $V_{true}=88$  KNOTS).

FIGURE 34, GRAPHICAL DATA

TYPE I CONDITION NO. 31

LEVEL FLIGHT, TRUE AIRSPEED = 113 KNOTS

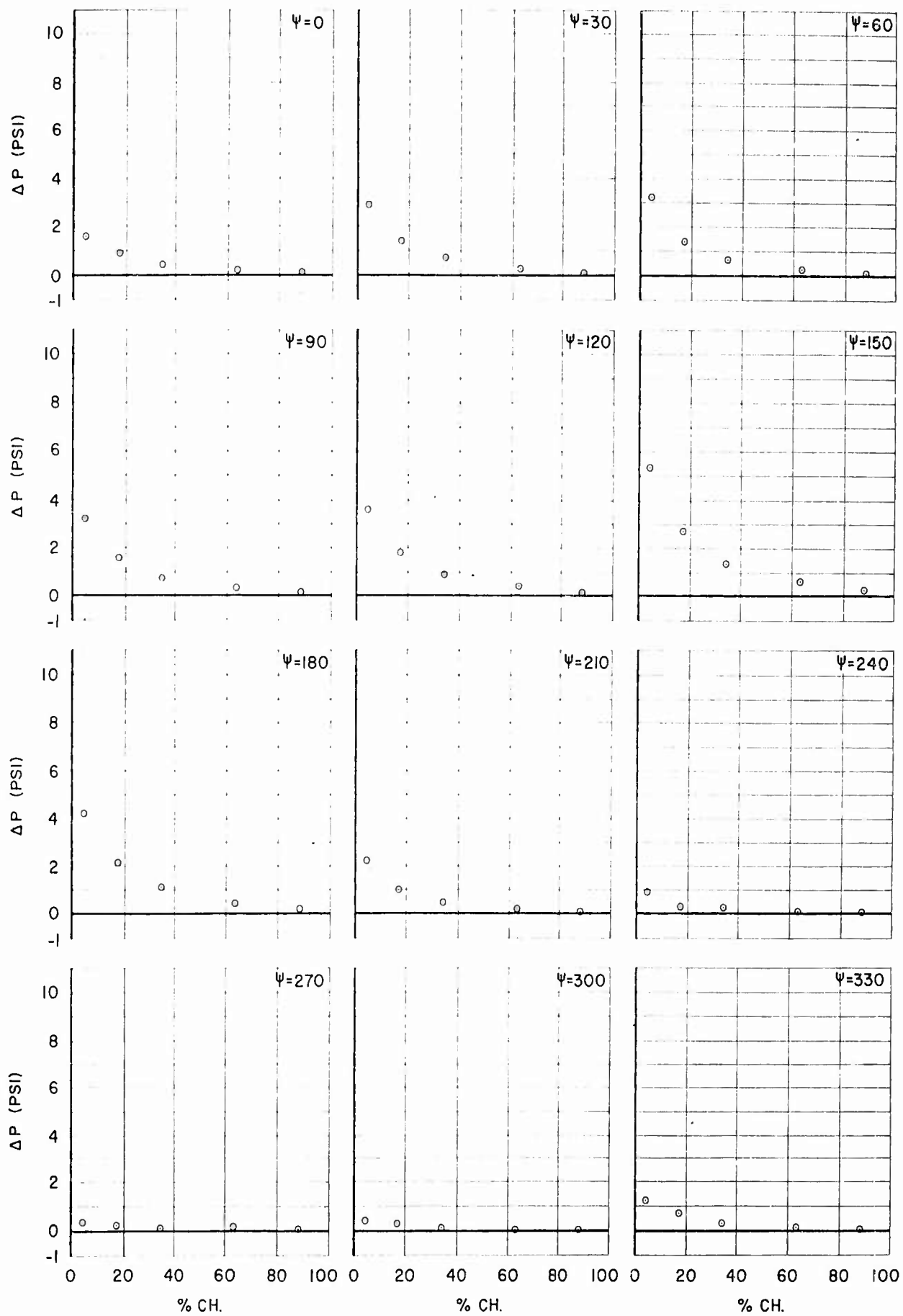


Figure 34a  $\Delta P$  vs % CHORD (40%  $\kappa$ , COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).



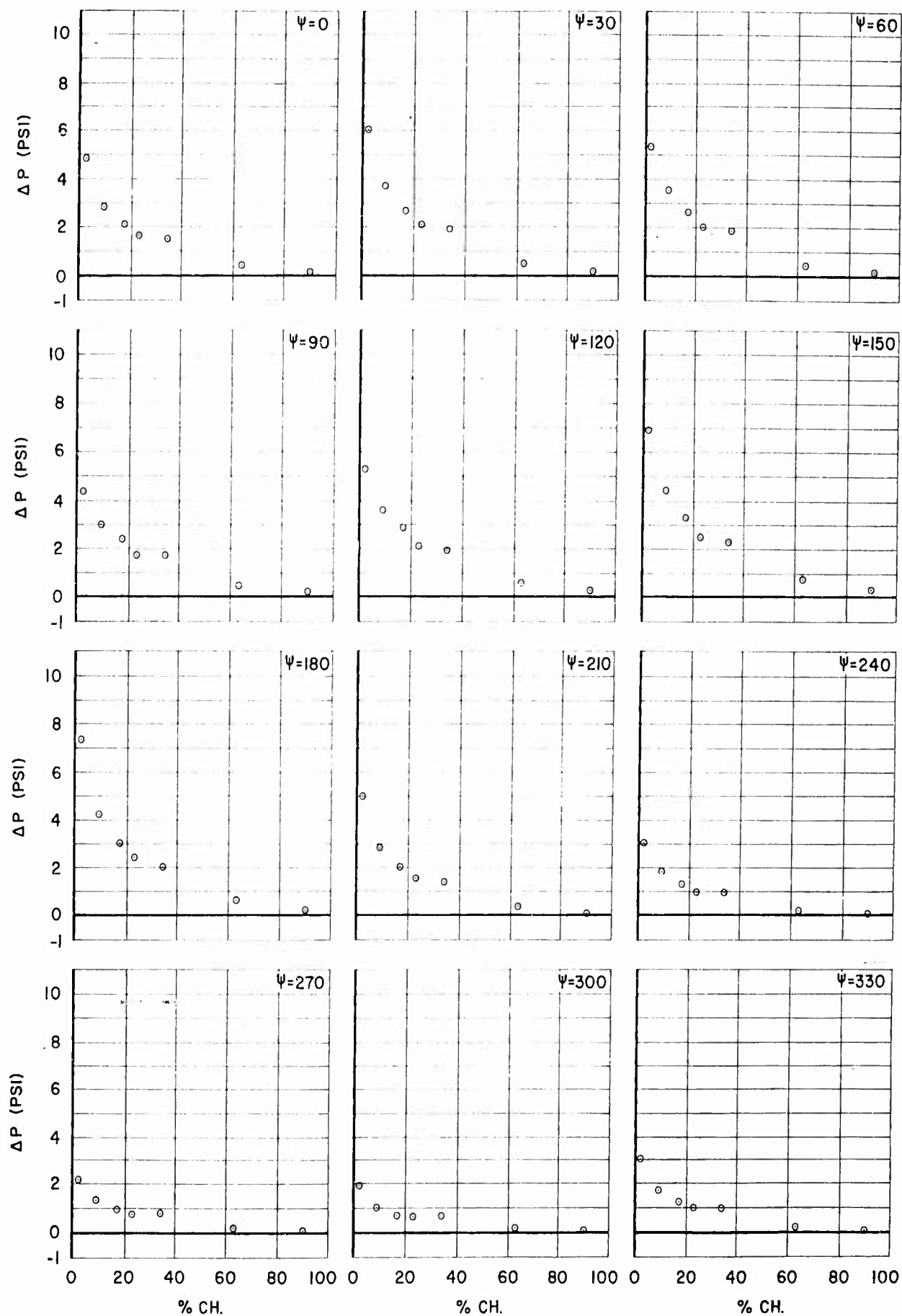


Figure 34b  $-\Delta P$  vs % CHORD (55% R, COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).

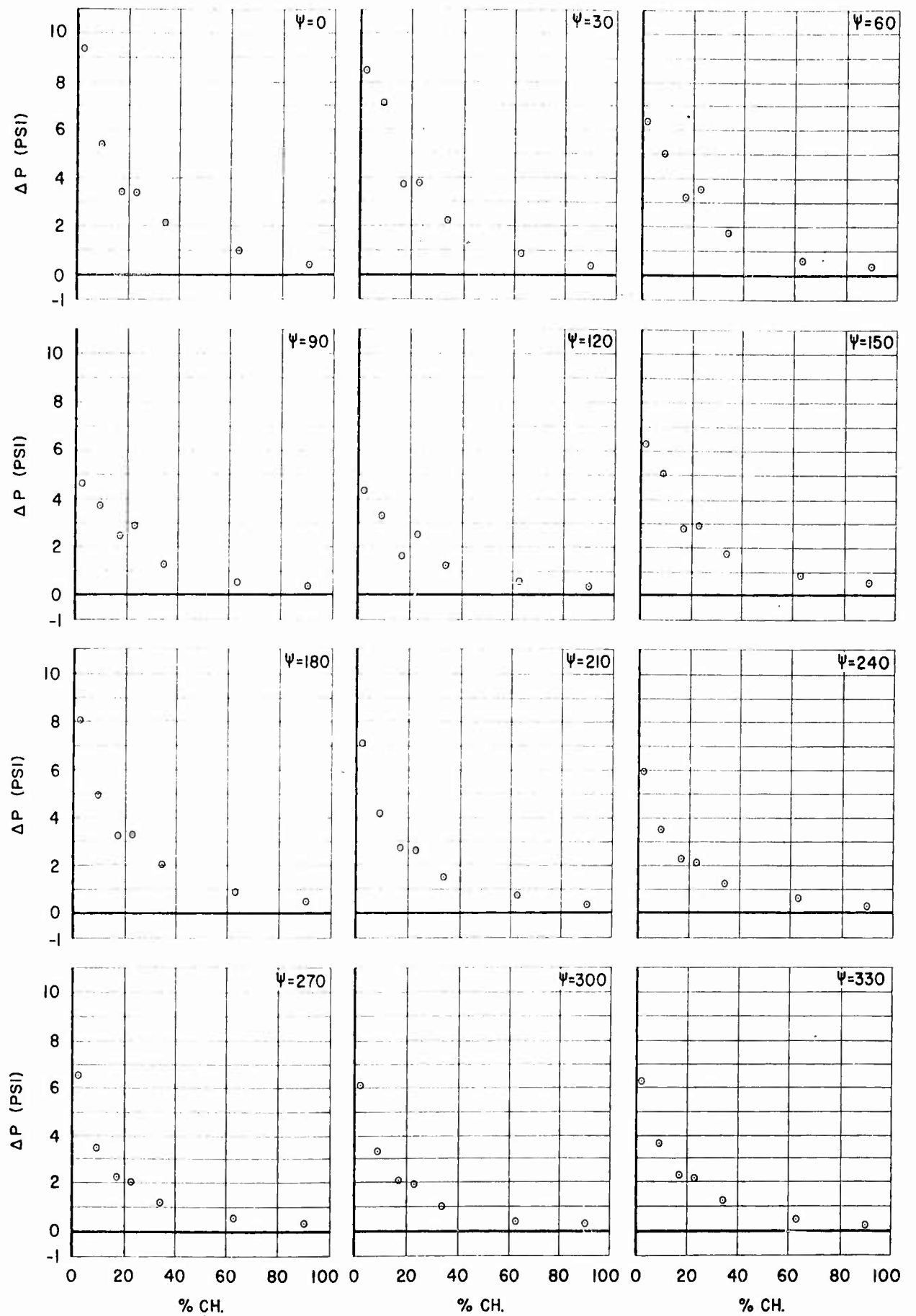


Figure 34c  $-\Delta P$  vs % CHORD (75% R, COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).

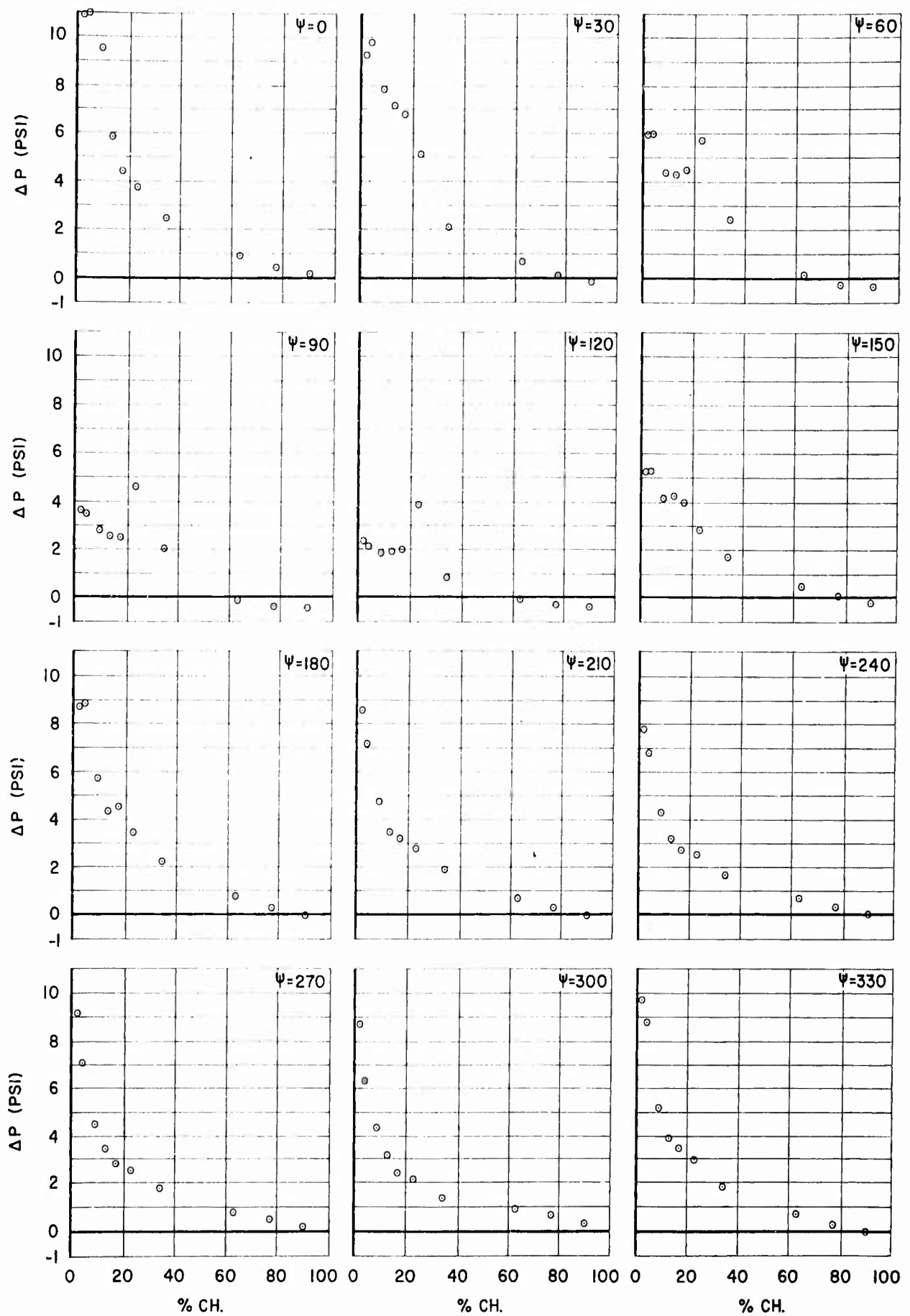


Figure 34d  $-\Delta P$  vs % CHORD (85% R, COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).

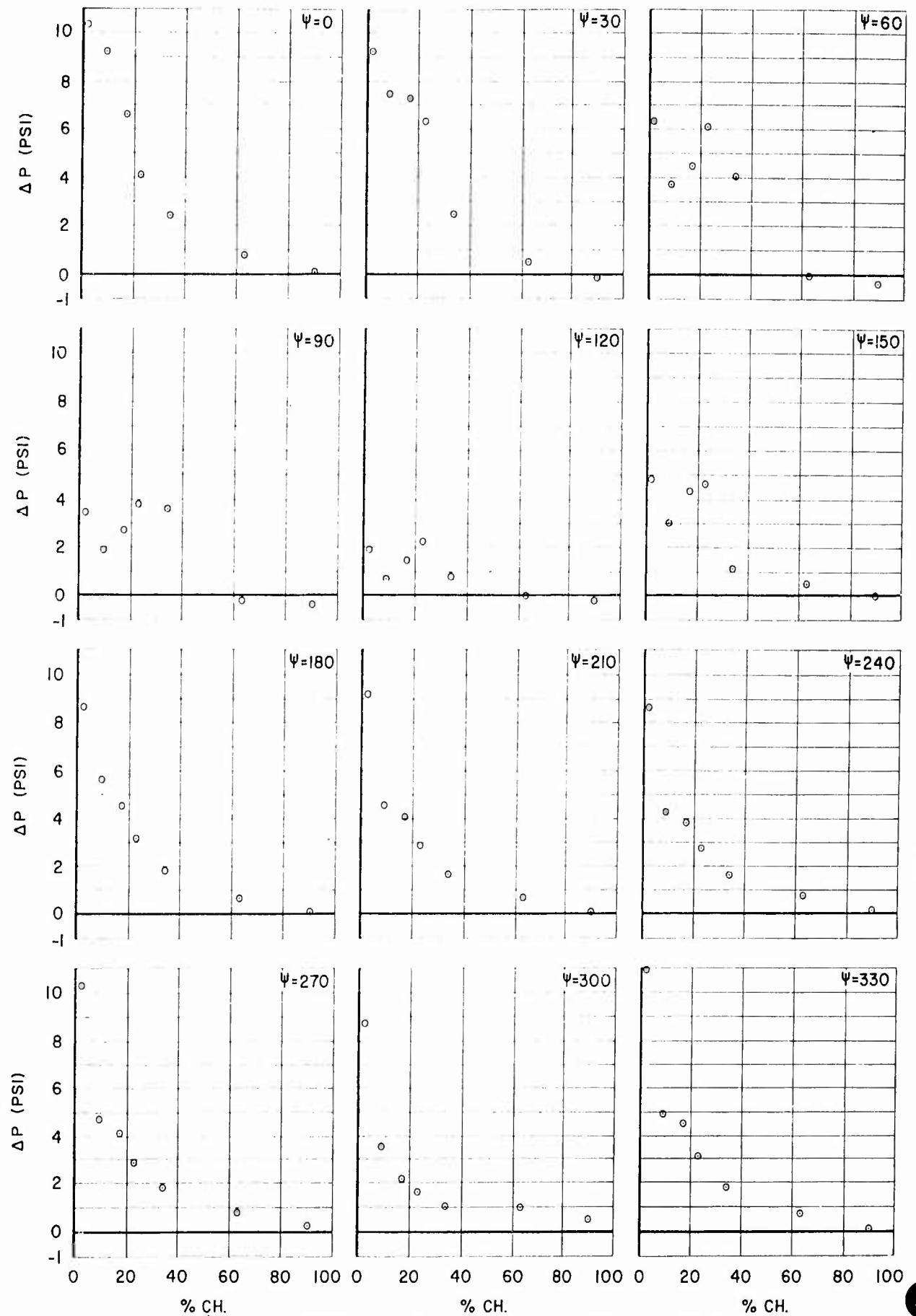


Figure 34e  $\Delta P$  vs % CHORD (90% R, COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).

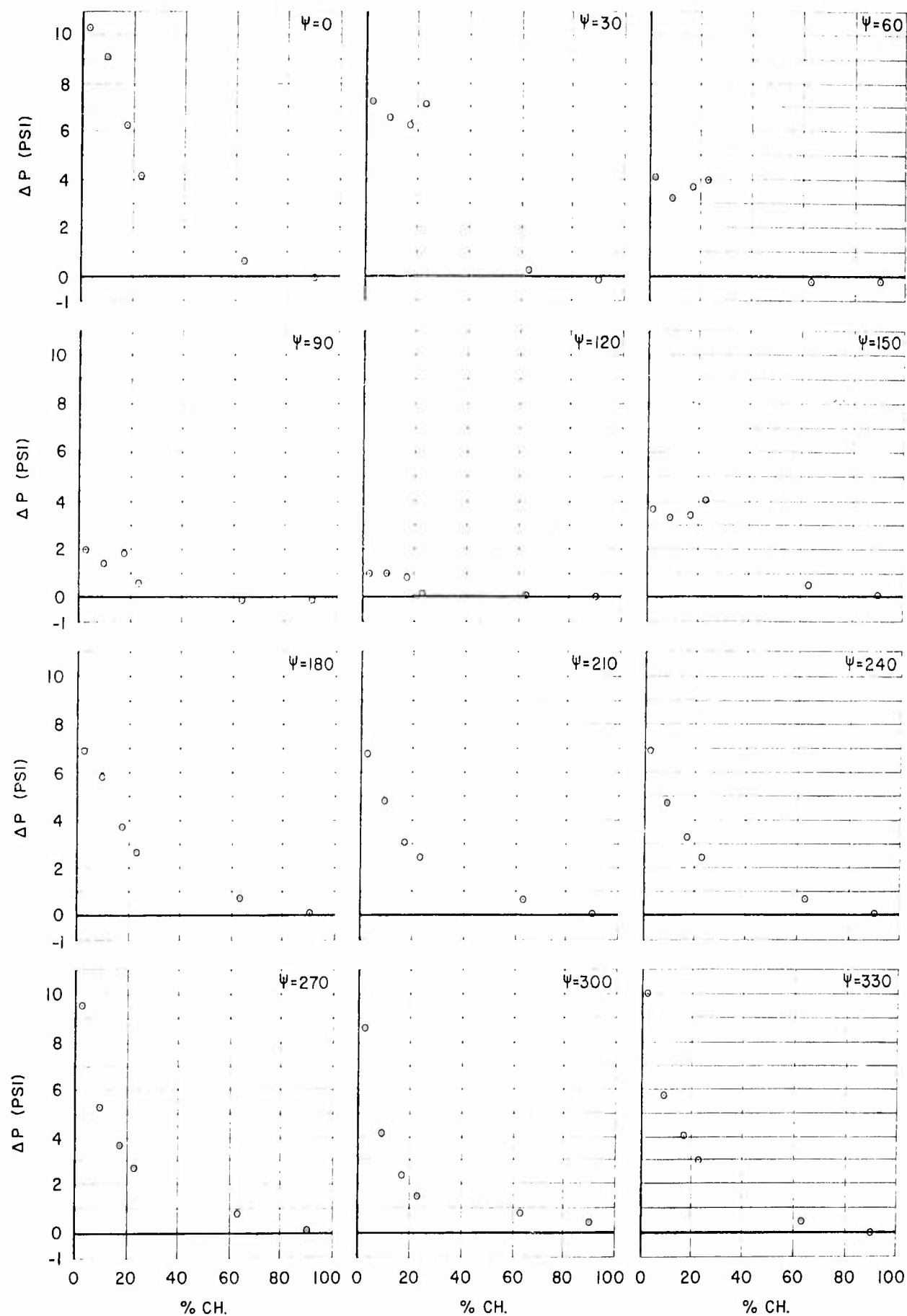


Figure 34f  $-\Delta P$  vs % CHORD (95% R, COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).

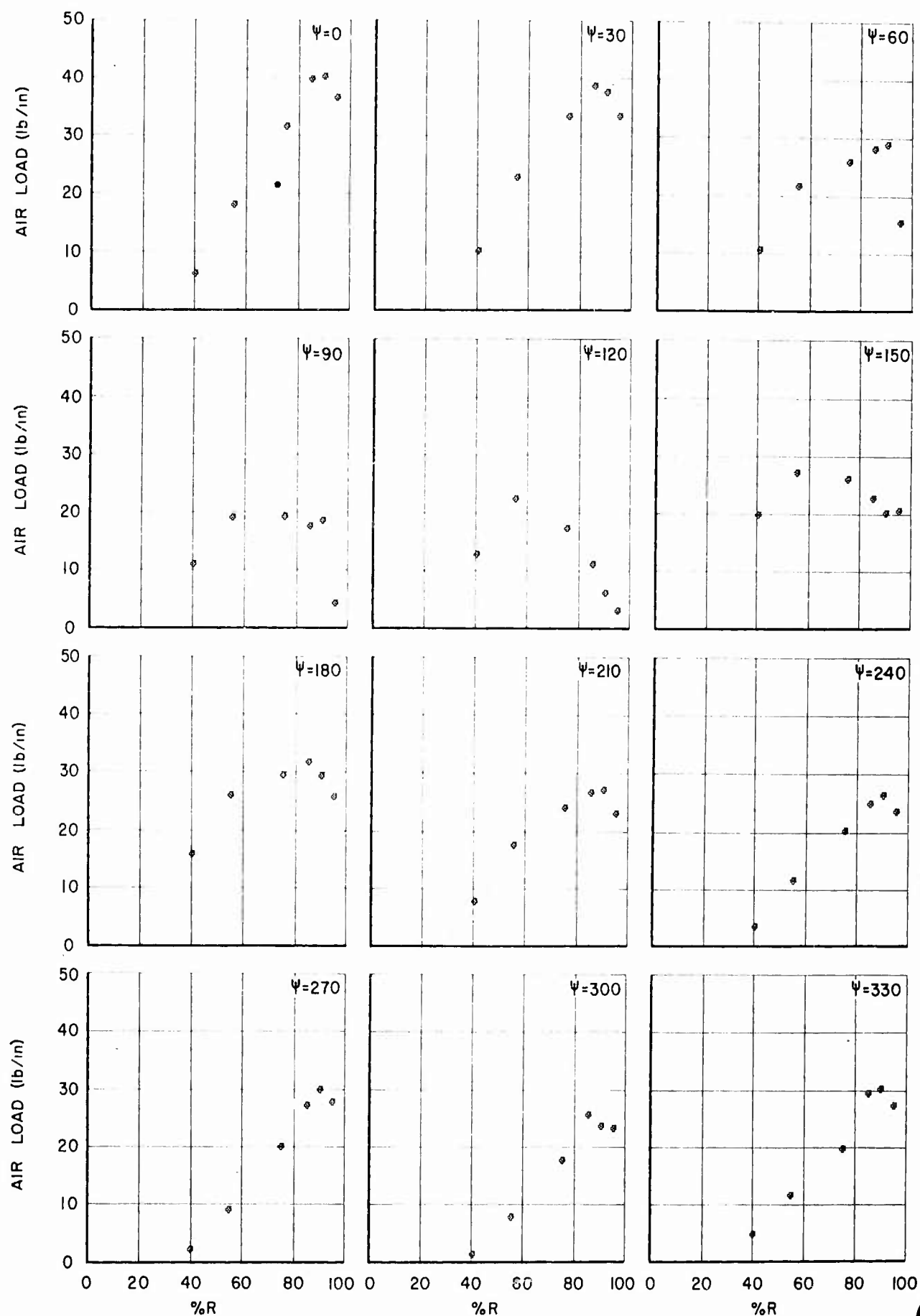


Figure 34g - AIR LOAD vs % RADIUS (COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).

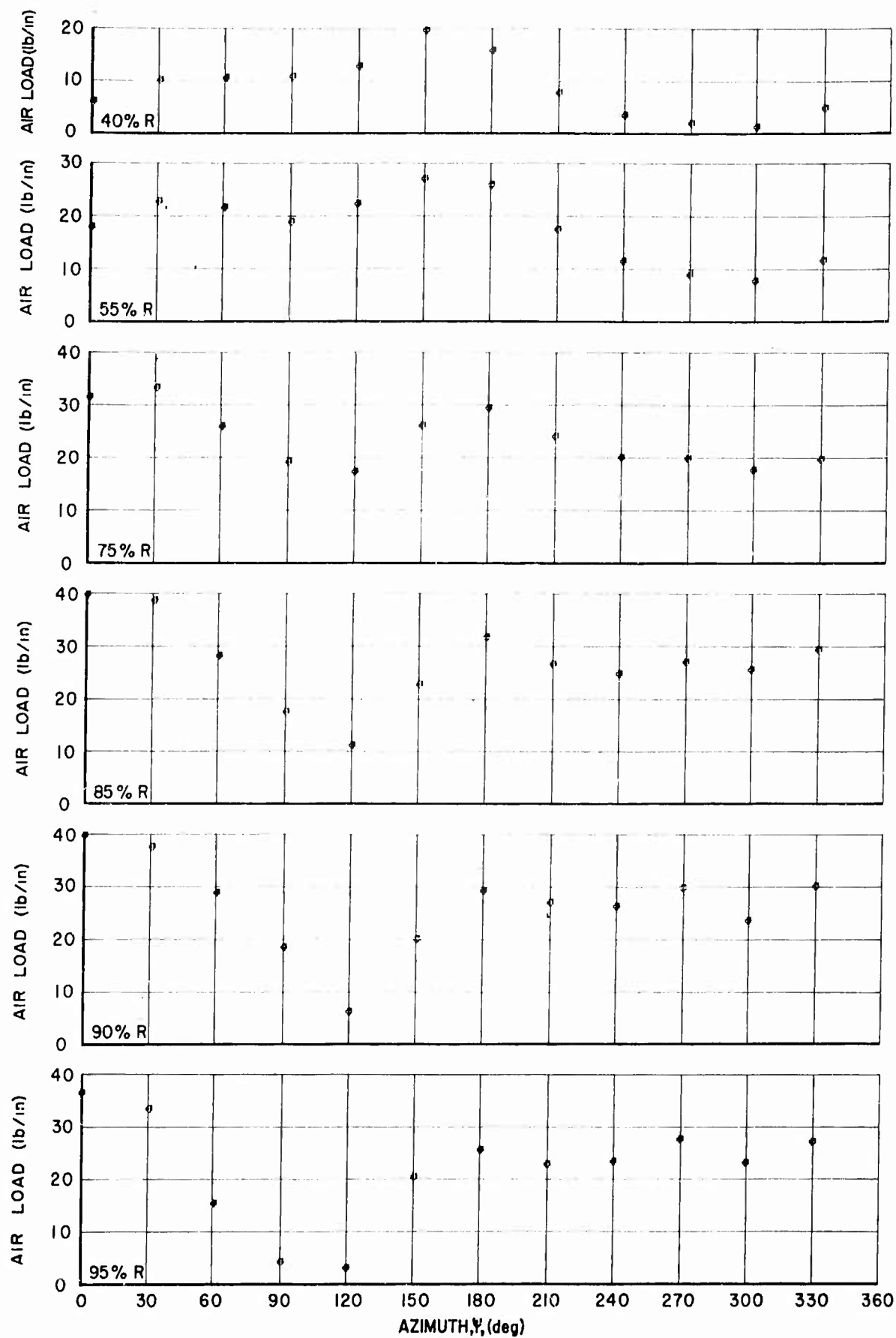


Figure 34h - AIR LOAD vs AZIMUTH (COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).

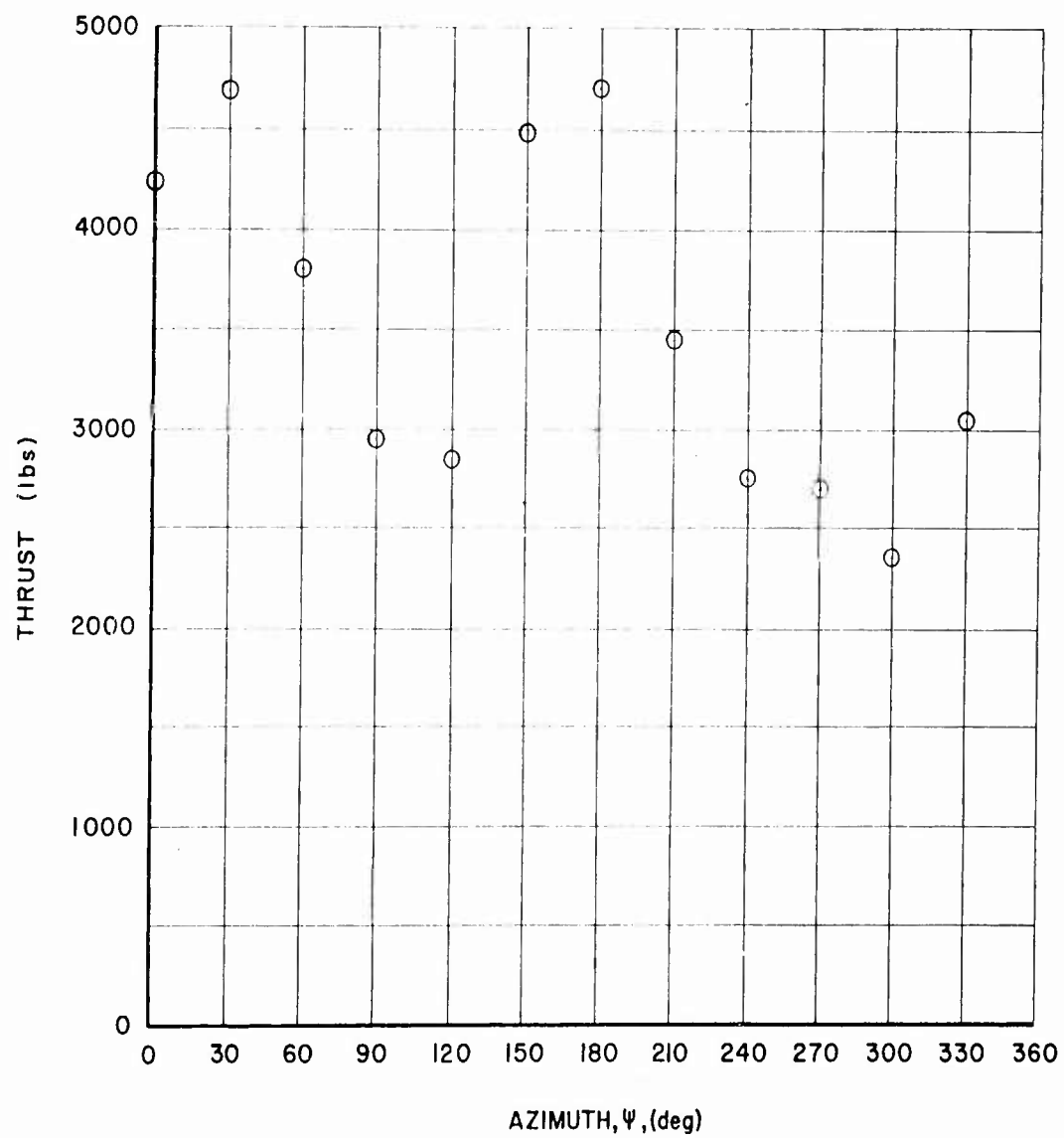


Figure 34i

TOTAL THRUST/BLADE vs AZIMUTH  
(COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).



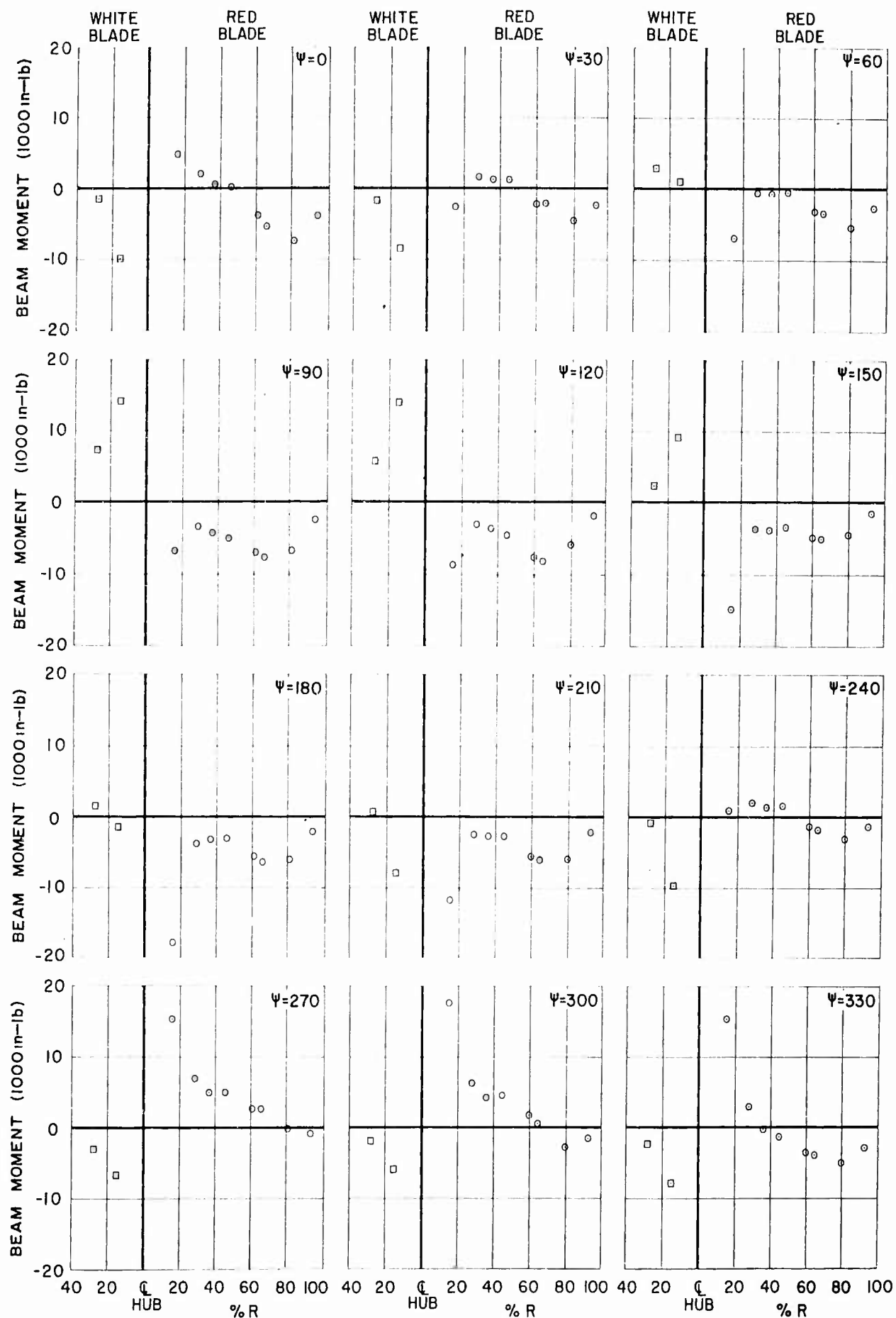


Figure 34j ~ BEAM MOMENT vs % RADIUS (COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).

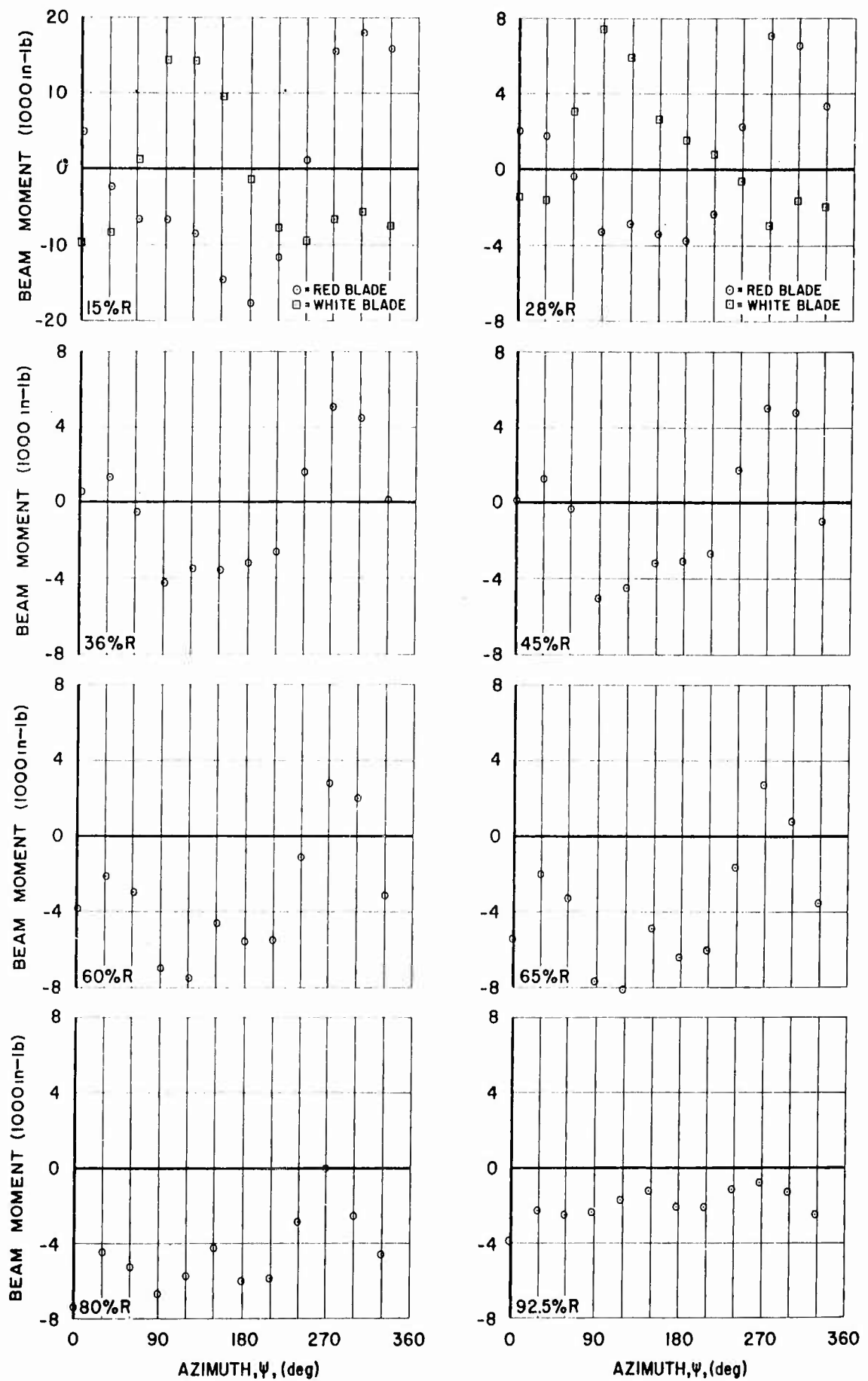


Figure 34k - BEAM MOMENT vs AZIMUTH (COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).

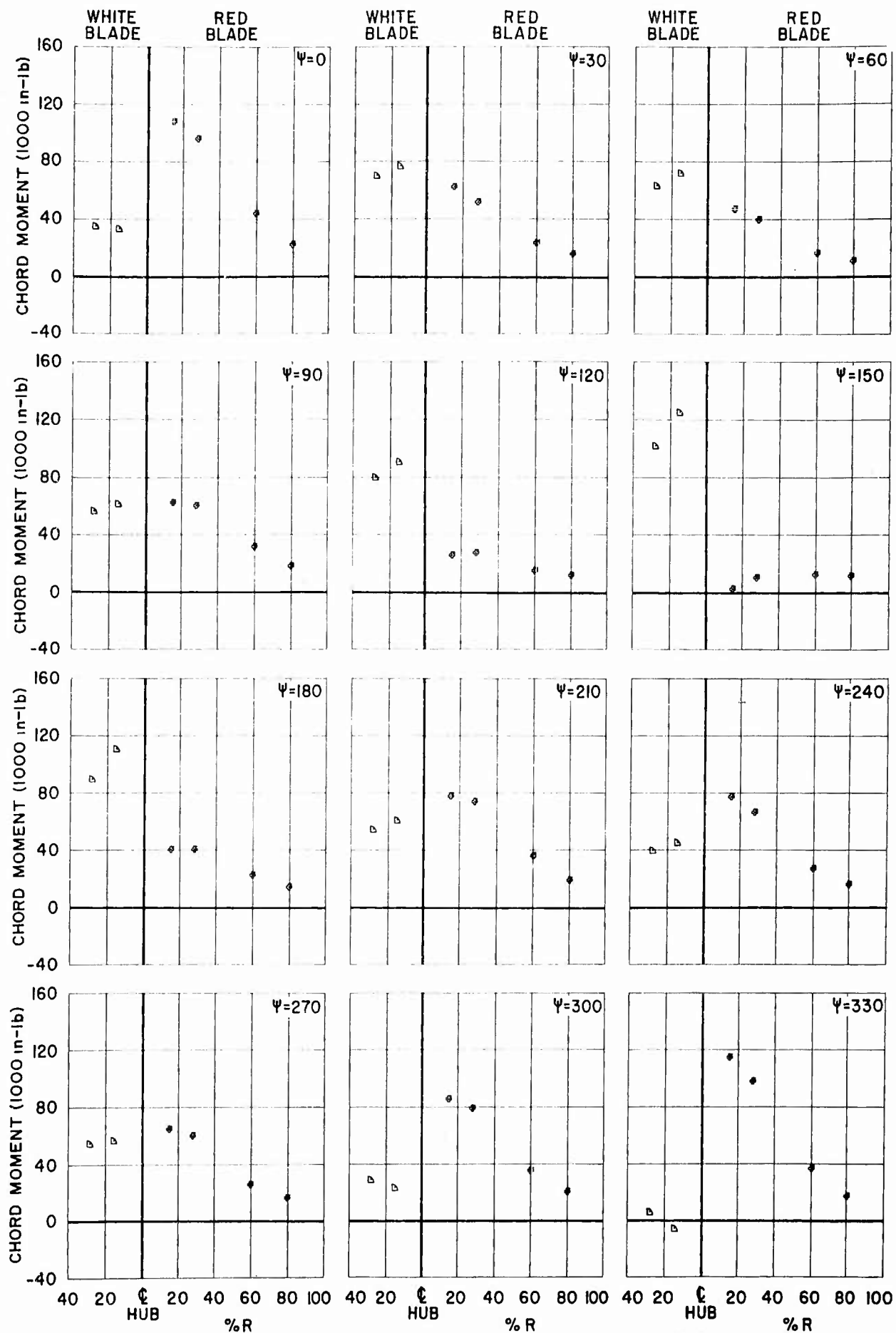


Figure 34m - CHORD MOMENT vs % RADIUS (COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS),

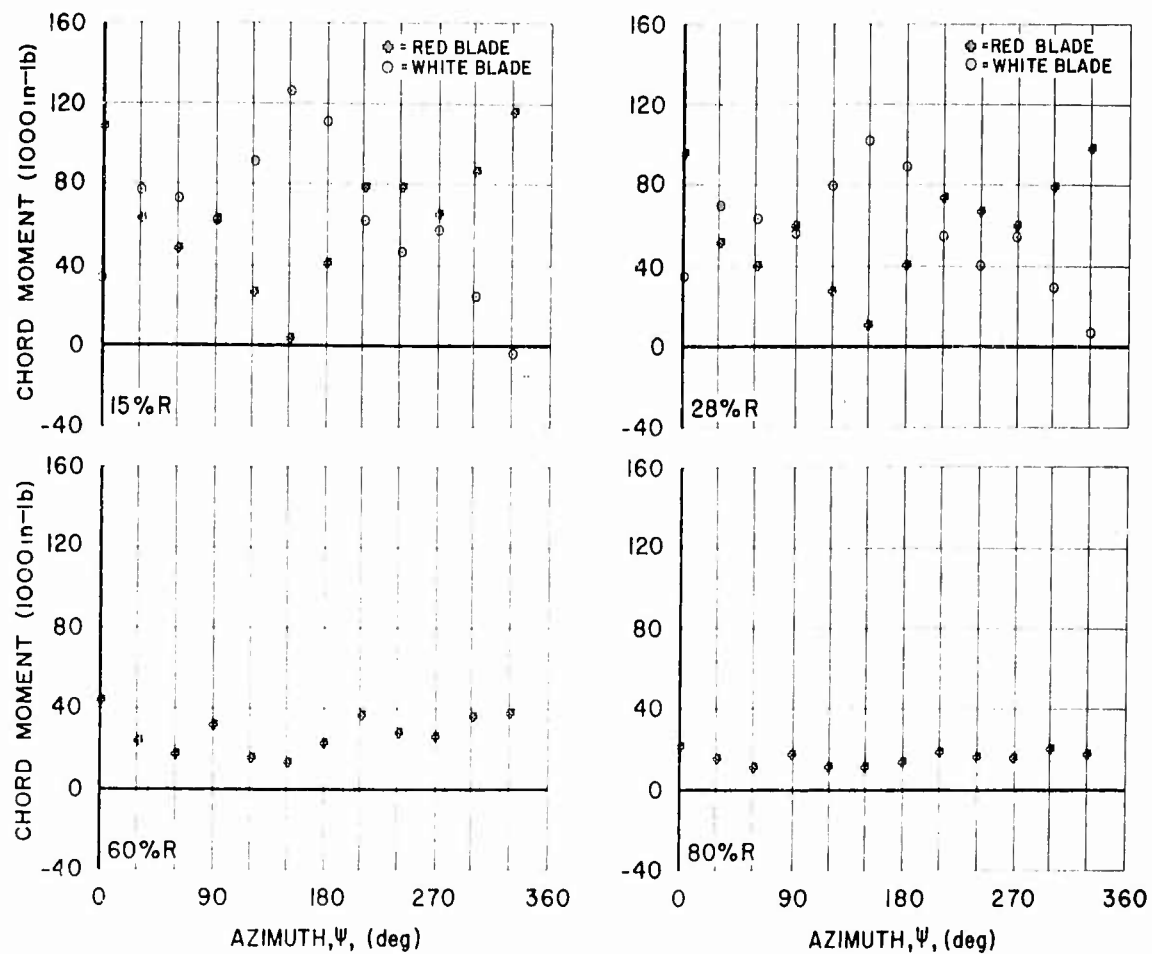


Figure 34n - CHORD MOMENT vs AZIMUTH (COND.NO.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).

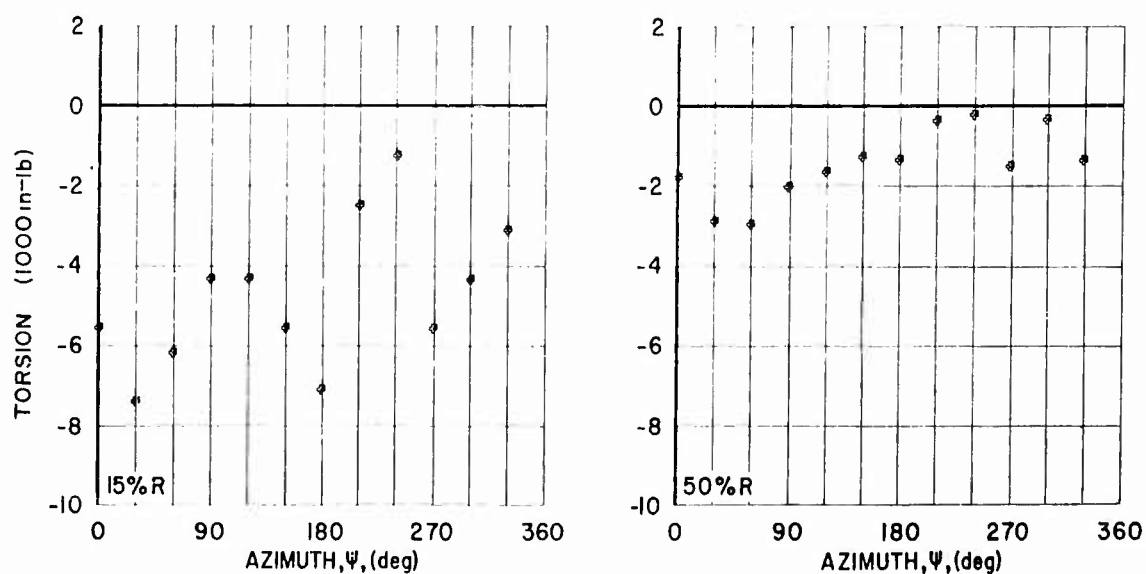


Figure 34o - TORSION vs AZIMUTH (COND.NC.31, LEVEL FLIGHT,  $V_{true}=113$  KNOTS).

FIGURE 35, GRAPHICAL DATA  
TYPE I CONDITION NO. 42  
HOVER OUT OF GROUND EFFECT

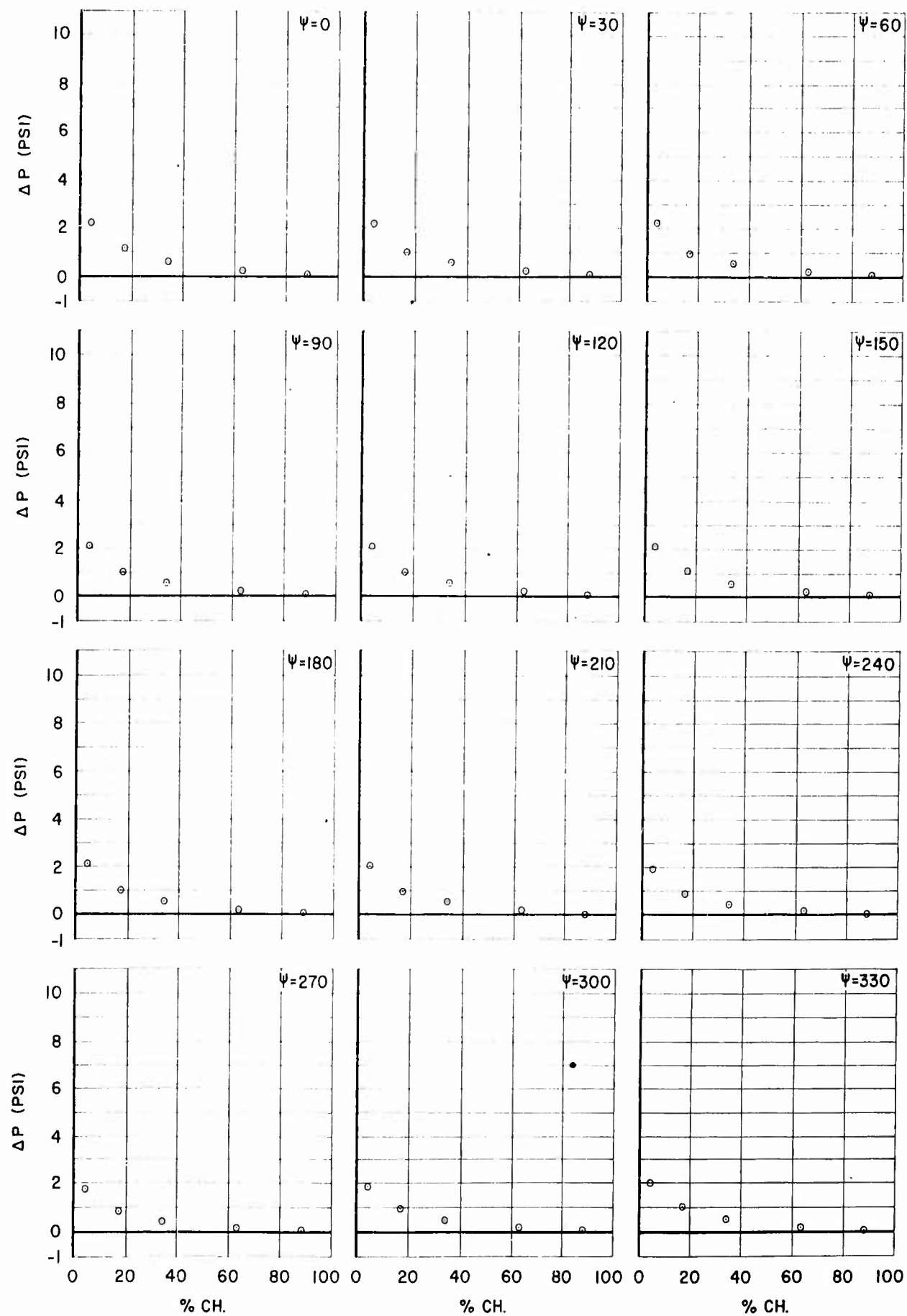


Figure 35a -  $\Delta P$  vs % CHORD (40% R, COND.NO.42, HOVER O.G.E.).

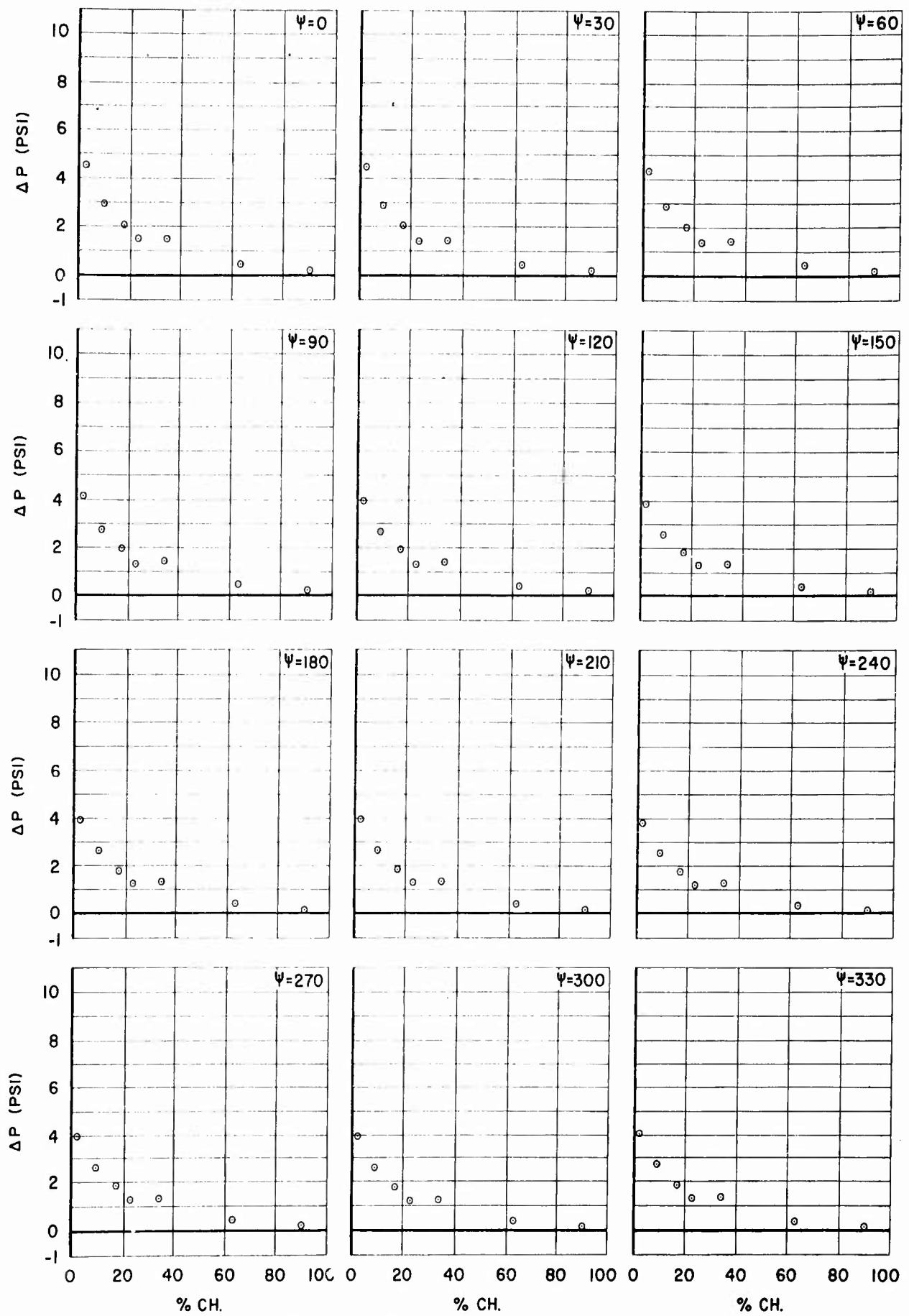


Figure 35b  $-\Delta P$  vs % CHORD (55% R, COND.NO.42, HOVER O.G.E.).

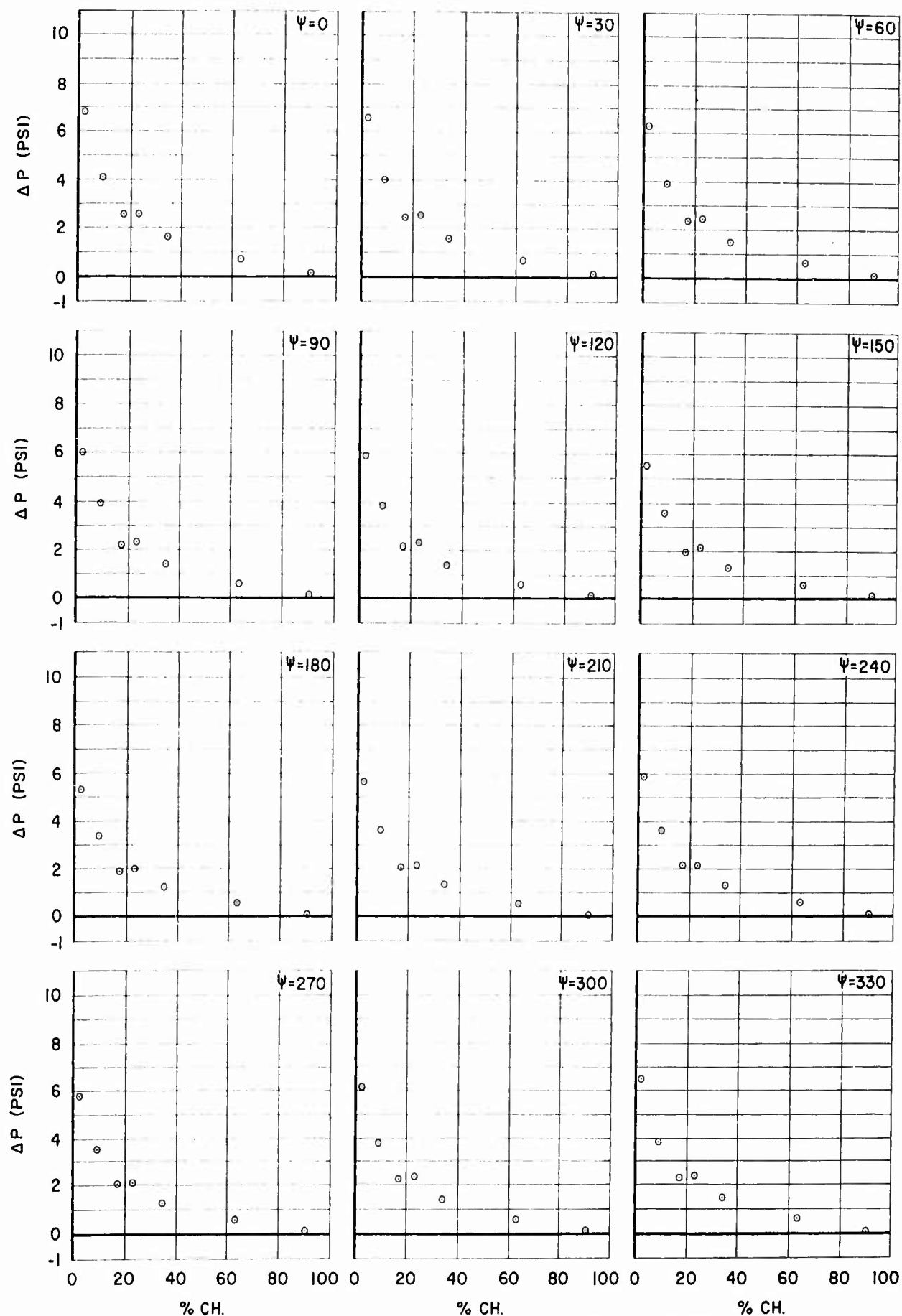


Figure 35c  $-\Delta P$  vs % CHORD (75% R, COND.NO.42, HOVER O.G.E.).



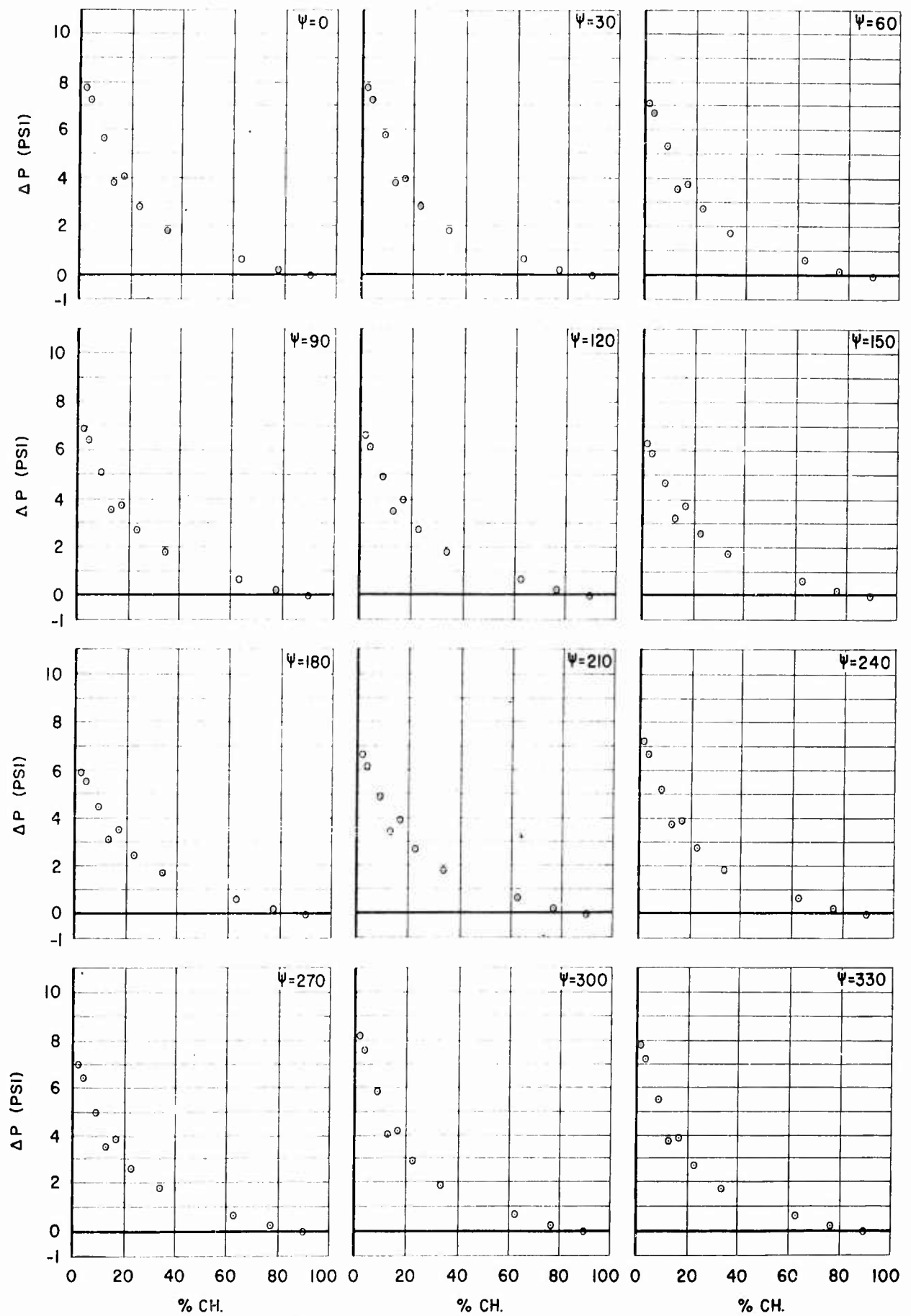


Figure 35d -  $\Delta P$  vs % CHORD (85% R, COND.NO.42, HOVER O.G.E.).

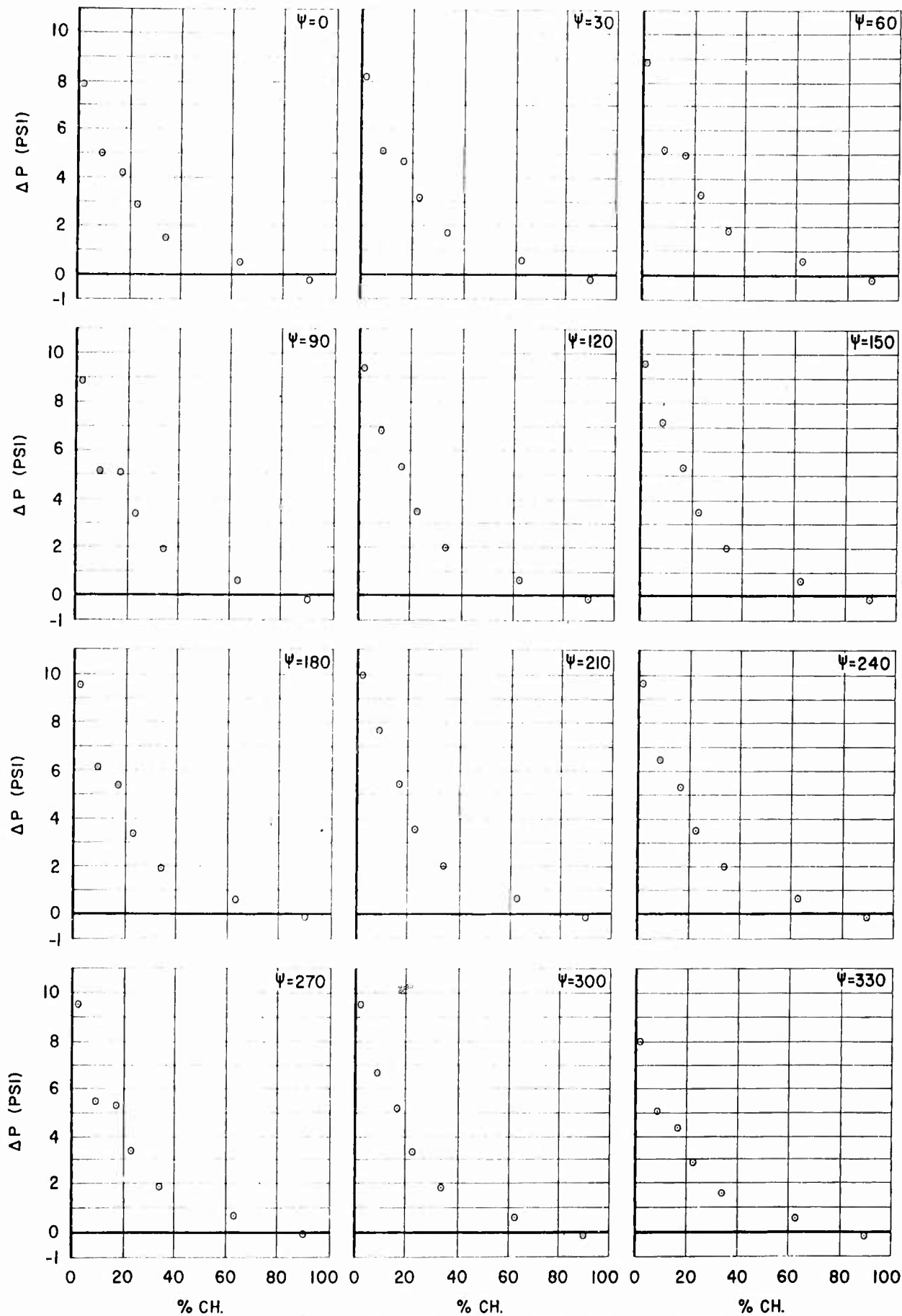


Figure 35e  $\Delta P$  vs % CHORD (90°R, COND. NO.42, HOVER O.G.E.).

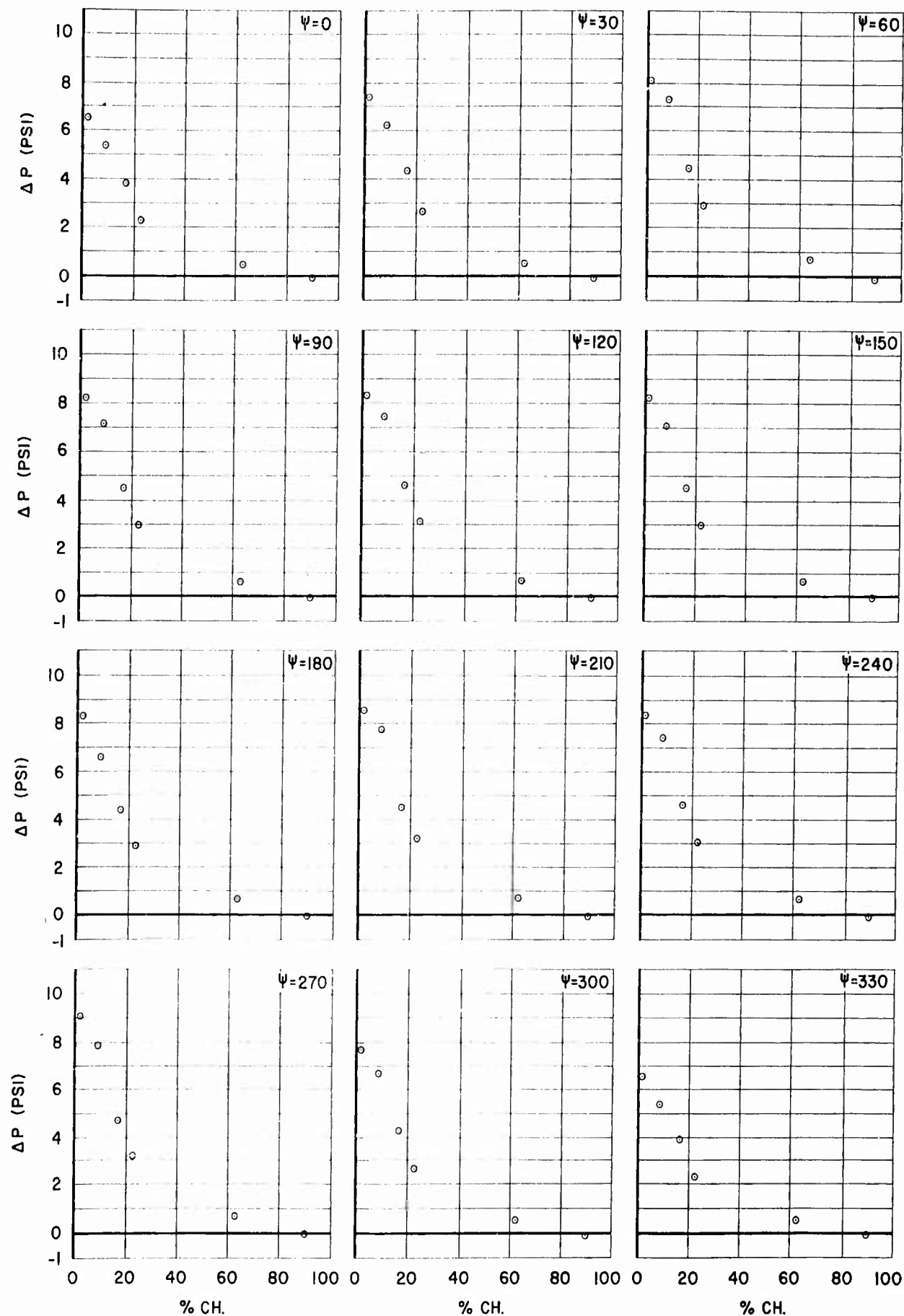


Figure 35f  $-\Delta P$  vs % CHORD (95% R, COND.NO.42, HOVER O.G.E.).

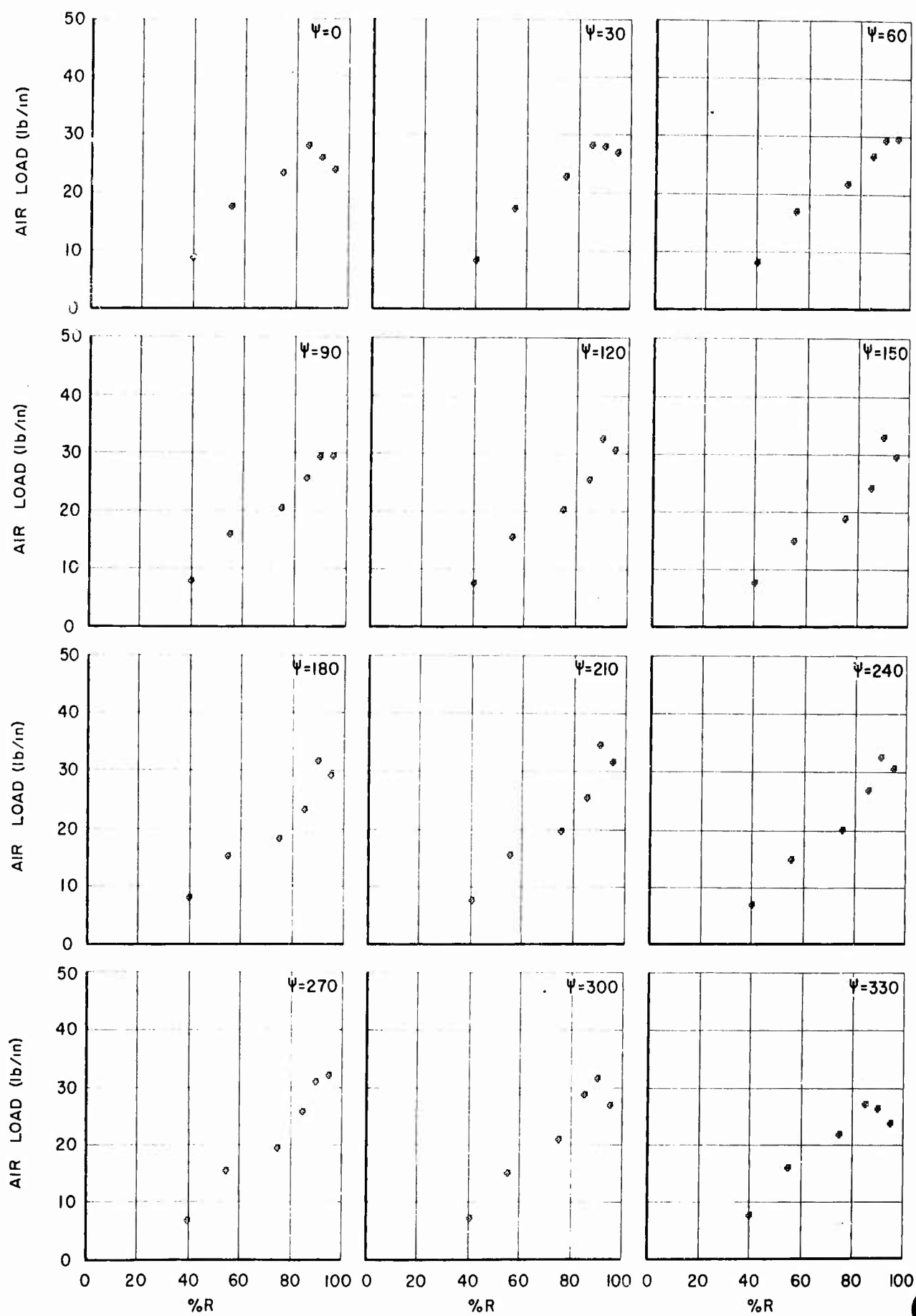


Figure 35g - AIR LOAD vs % RADIUS (COND.NO.42, HOVER O.G.E.).

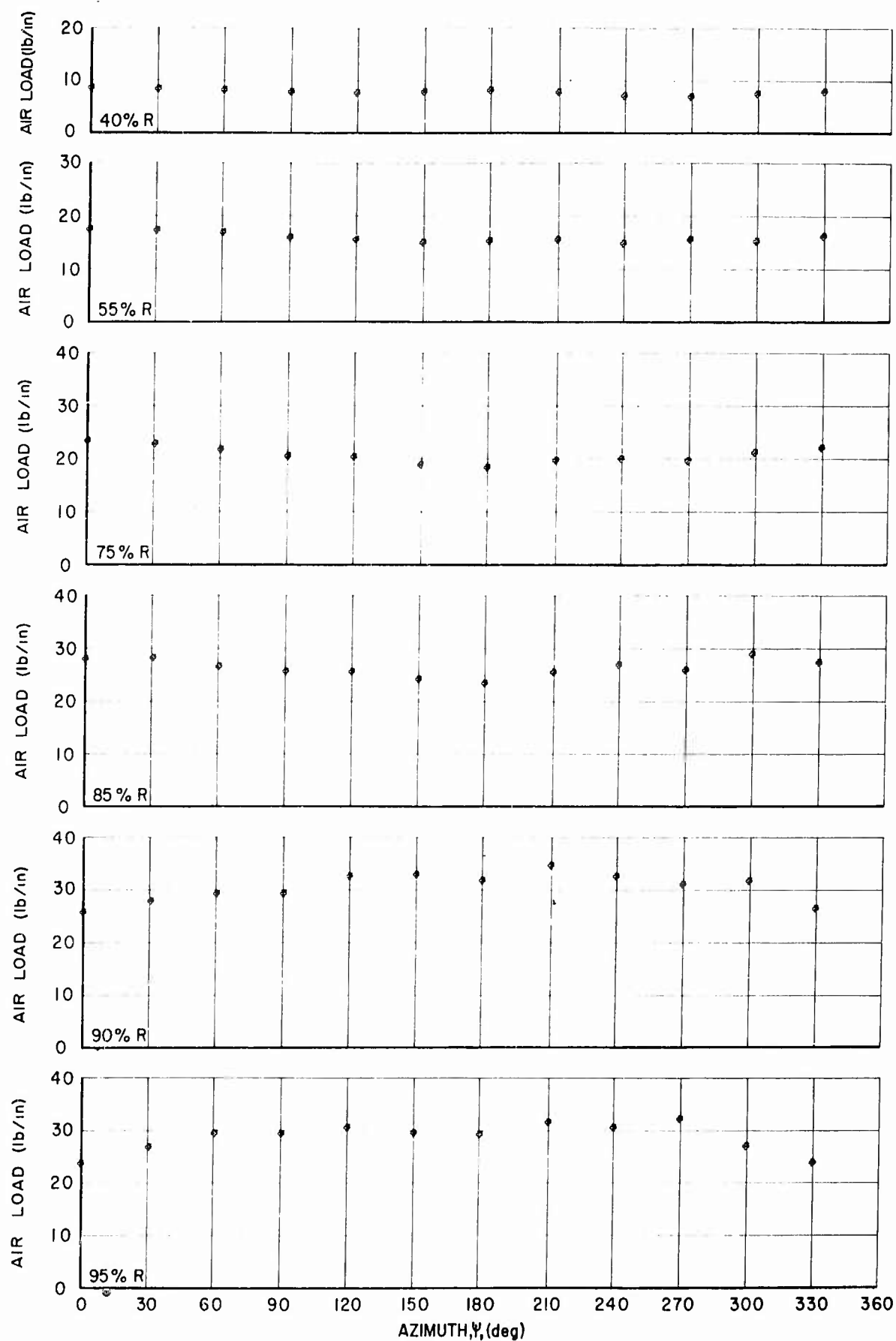


Figure 35h - AIR LOAD vs AZIMUTH (COND.NO.42, HOVER O.G.E.).

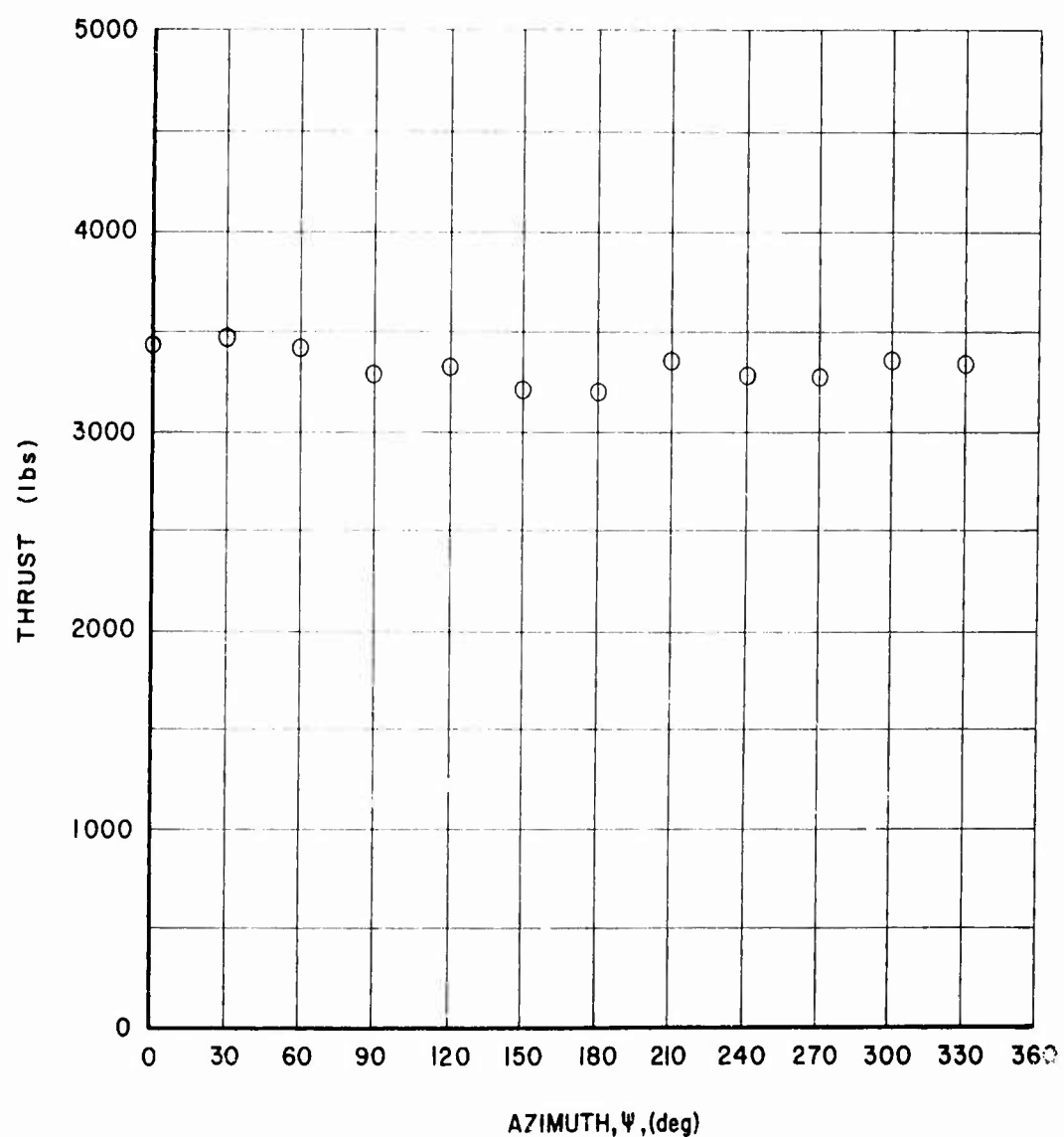


Figure 35i - TOTAL THRUST/BLADE vs AZIMUTH (COND.NO.42, HOVER O.G.E.).

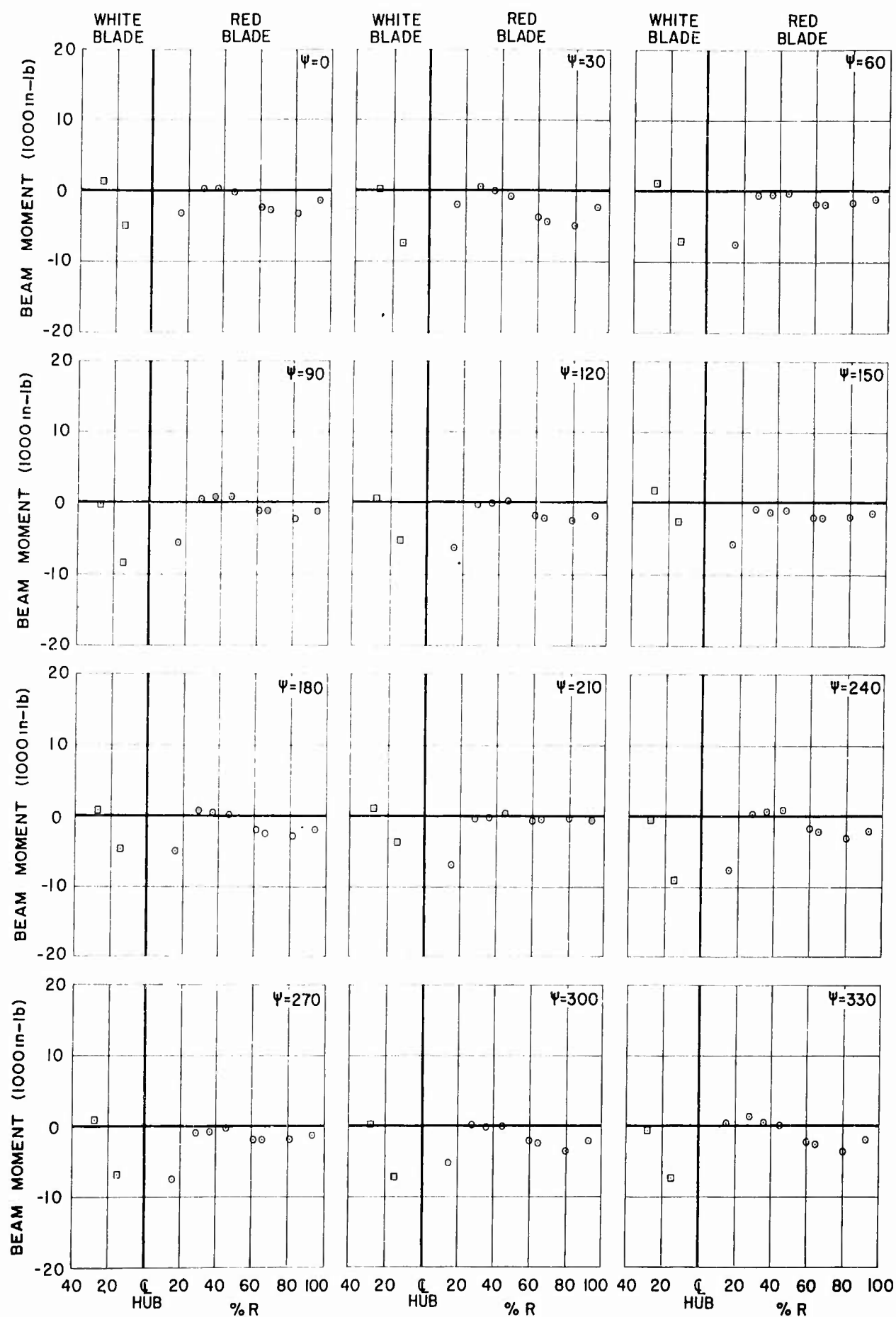


Figure 35j - BEAM MOMENT vs % RADIUS (COND.NO.42, HOVER O.G.E.).

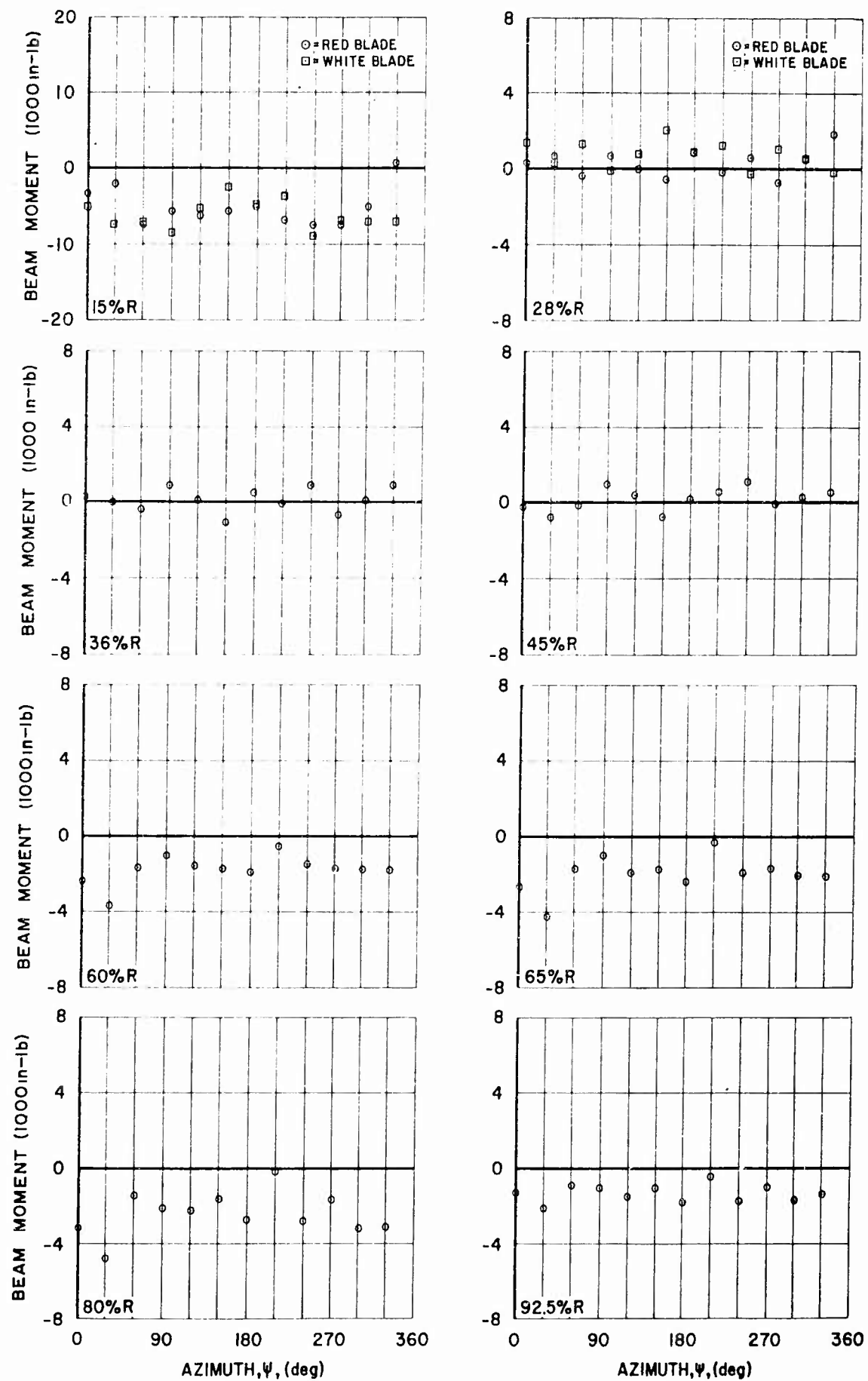


Figure 35k - BEAM MOMENT vs AZIMUTH (COND.NO.42, HOVER O.G.E.).



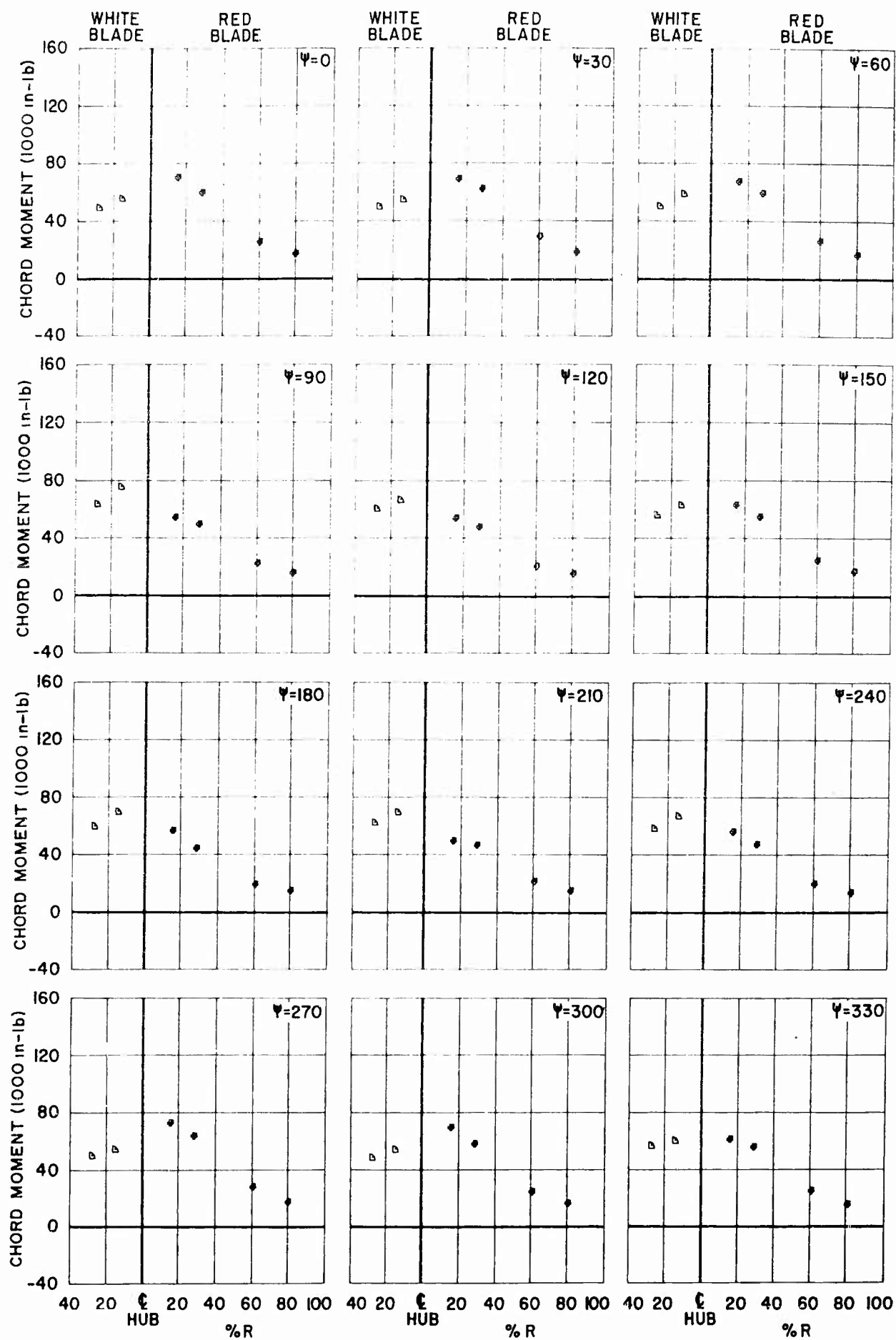


Figure 35m - CHORD MOMENT vs % RADIUS (COND.NO.42, HOVER O.G.E.).

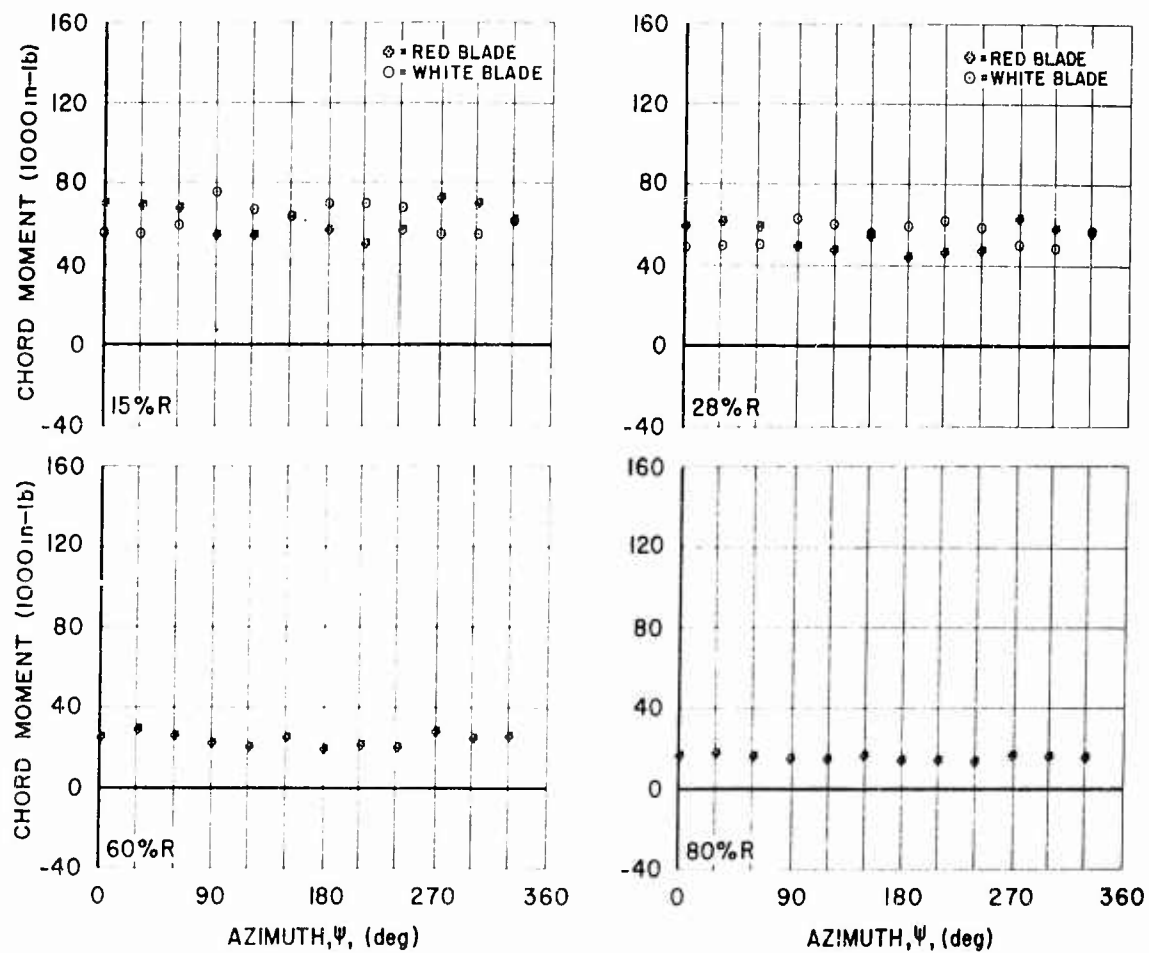


Figure 35n - CHORD MOMENT vs AZIMUTH (COND.NO.42, HOVER O.G.E.),

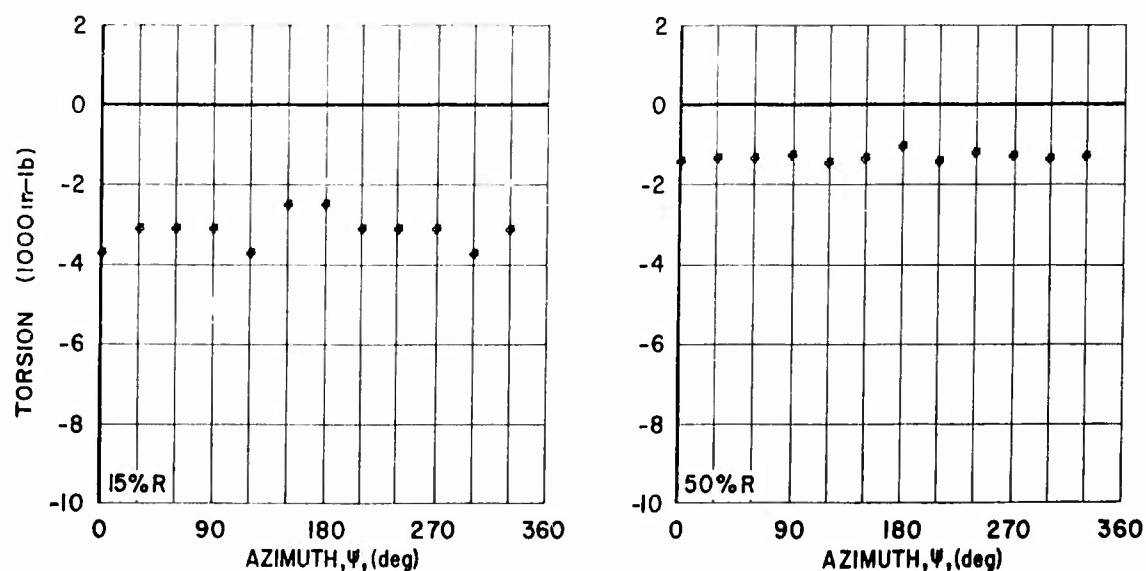


Figure 35o - TORSION vs AZIMUTH (COND.NO.42, HOVER O.G.E.).

FIGURE 36, GRAPHICAL DATA

TYPE I CONDITION NO. 55

HIGH ALTITUDE STALL THRESHOLD, TRUE AIRSPEED = 91 KNOTS

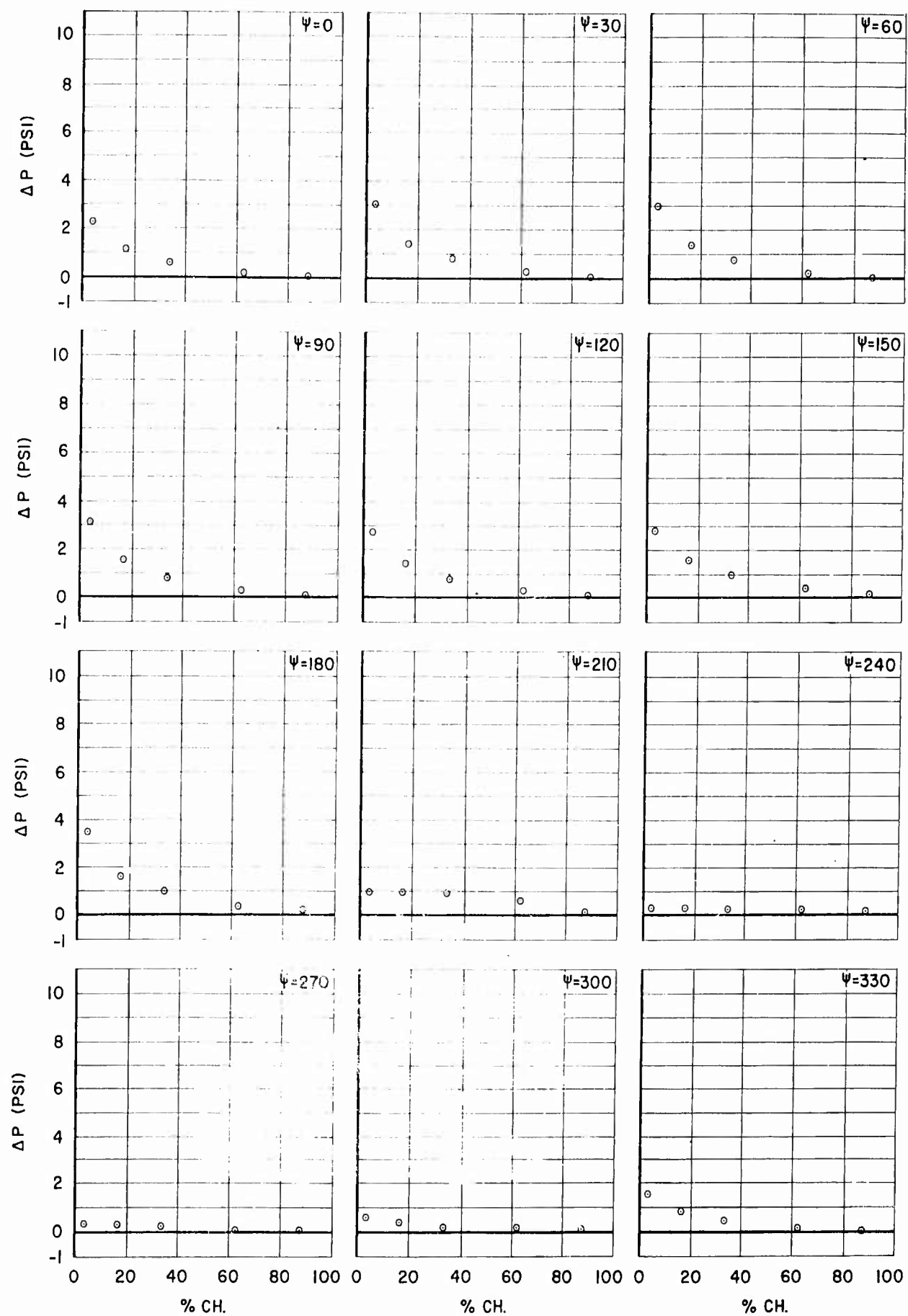


Figure 36a- $\Delta P$  vs % CHORD (40% R, COND. NO. 55, HIGH ALT. STALL THRESHOLD,  $V_{true} = 91$  KNOTS).

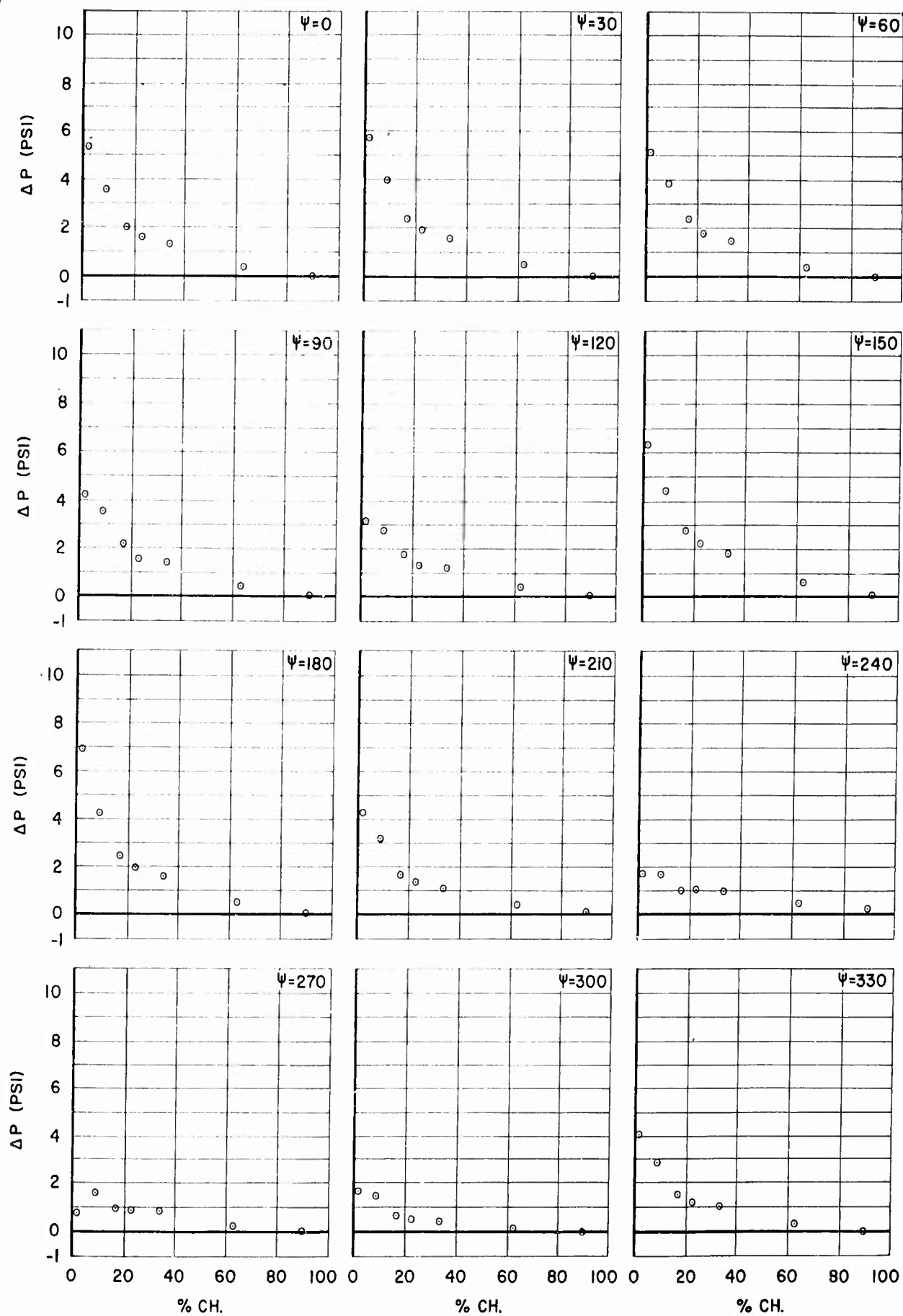


Figure 36b- $\Delta P$  vs % CHORD (55% R, COND. NO. 55, HIGH ALT. STALL THRESHOLD,  $V_{true}=91$  KNOTS),

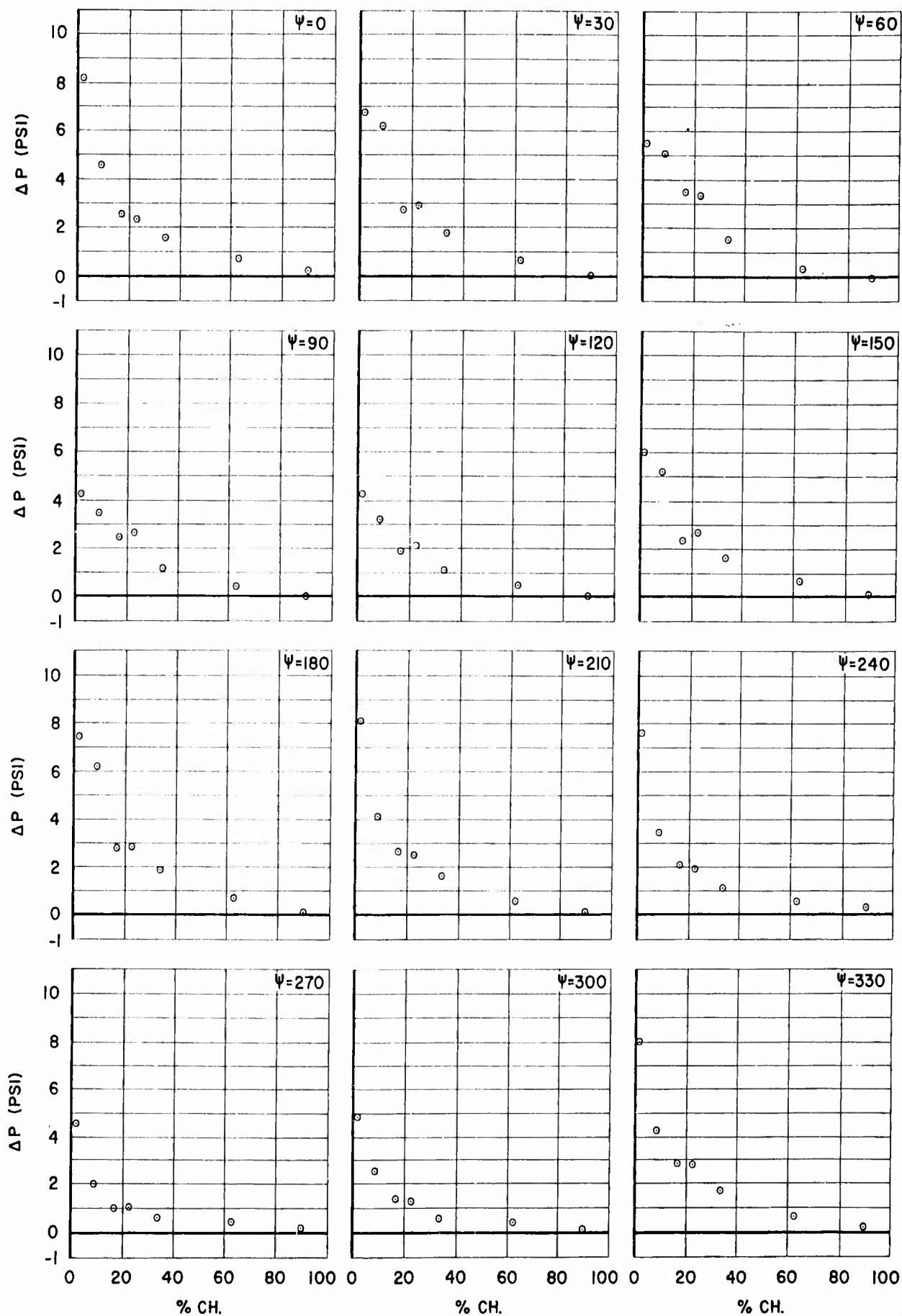


Figure 36c- $\Delta P$  vs % CHORD (75% R, COND. NO. 55, HIGH ALT. STALL THRESHOLD,  $V_{true} = 91$  KNOTS).

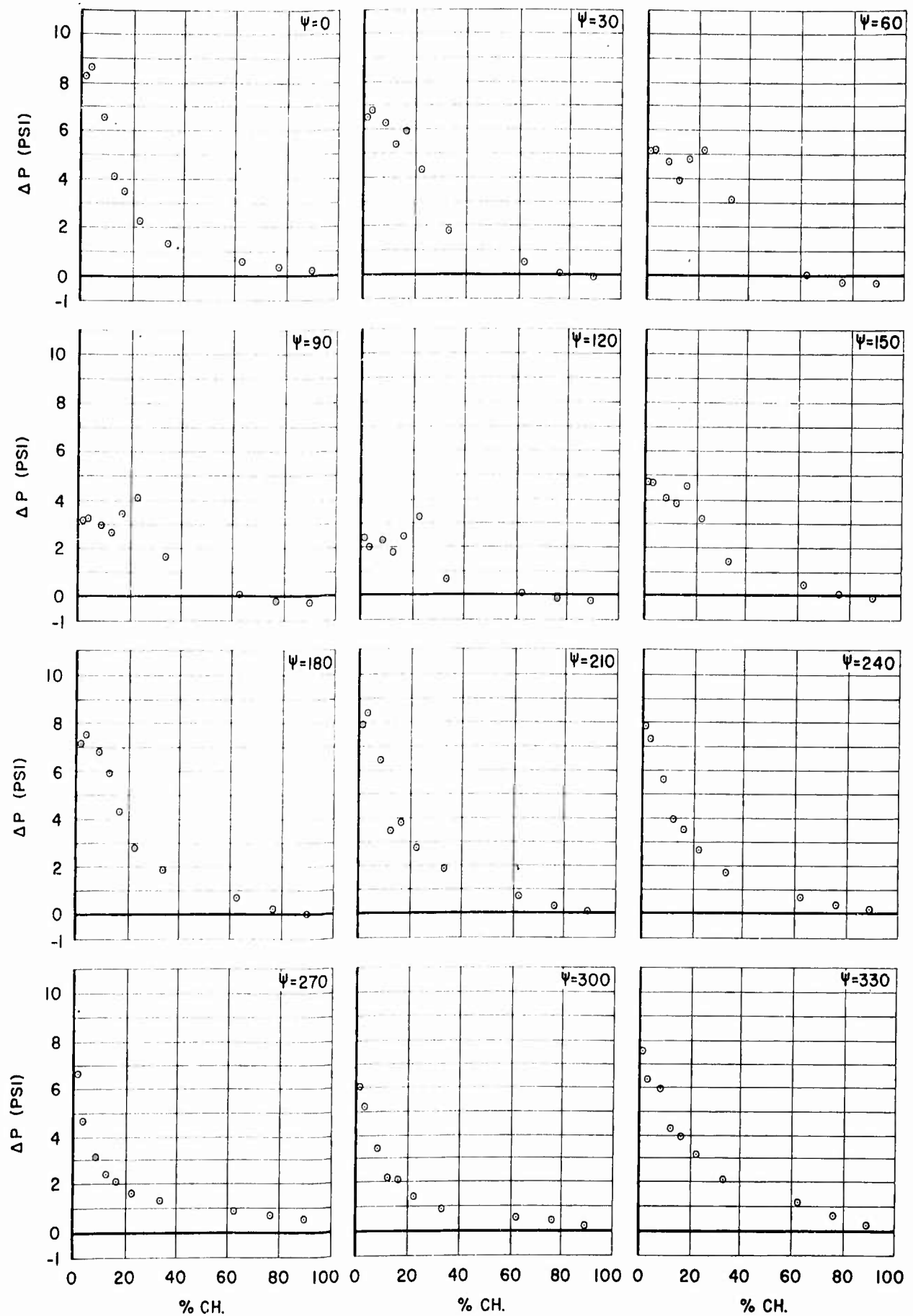


Figure 36d- $\Delta P$  vs % CHORD (85% R, COND. NO. 55, HIGH ALT. STALL THRESHOLD,  $V_{true}=91$  KNOTS).

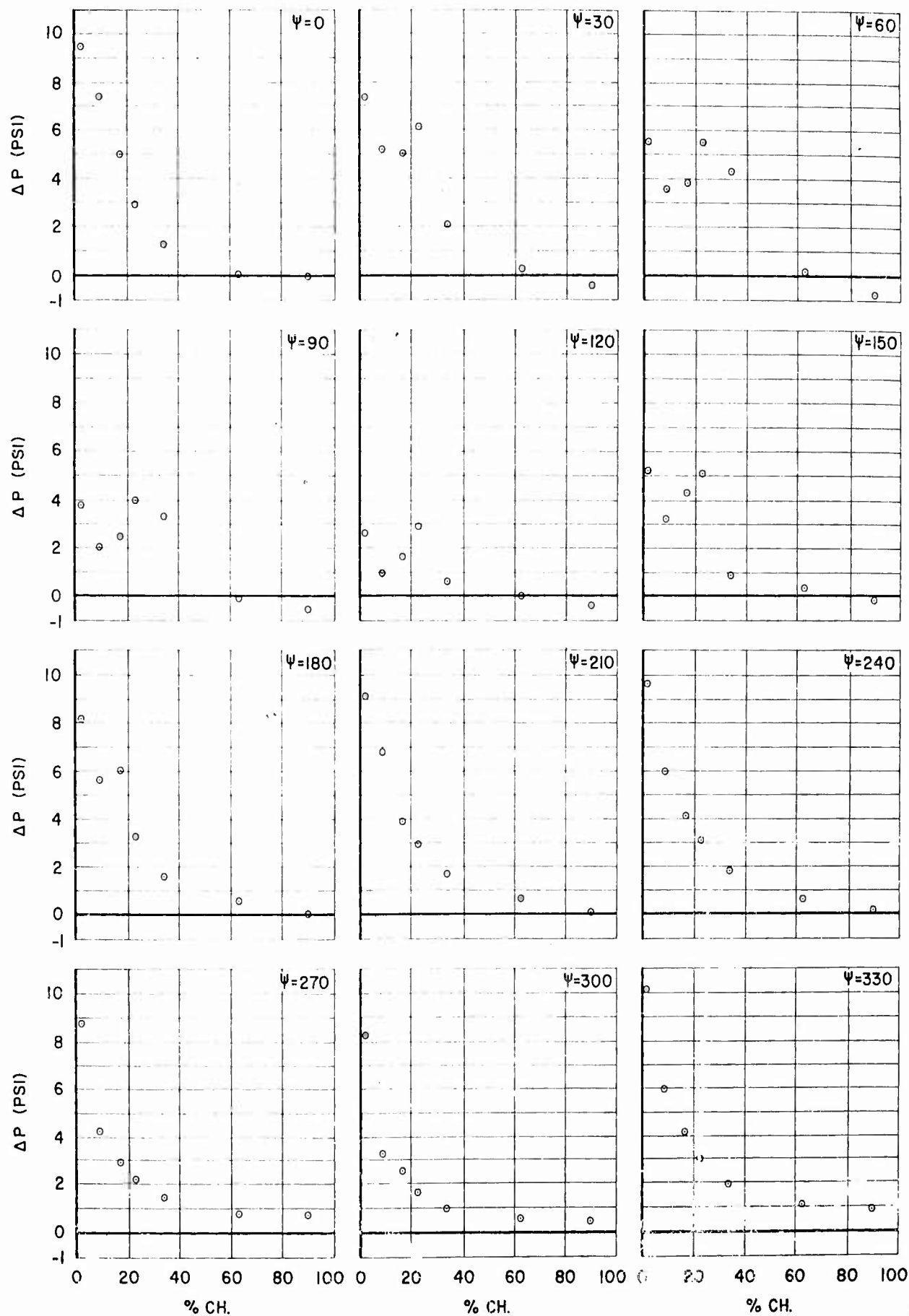


Figure 36e- $\Delta P$  vs % CHORD (0.0% R, COND. NO. 55, HIGH ALT. STALL THRESHOLD,  $V_{true}=91$  KNOTS).



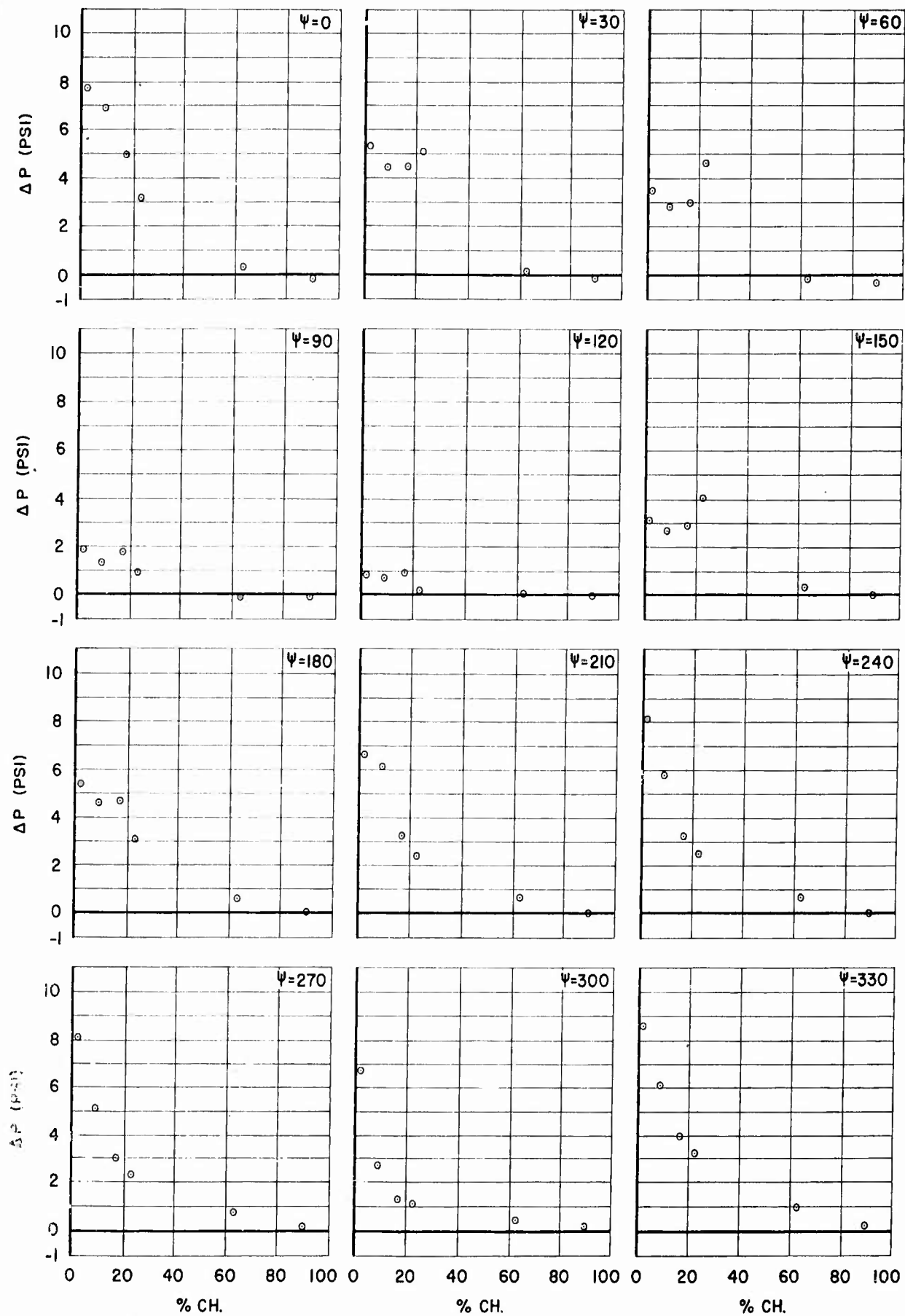


Figure 36f- $\Delta P$  vs % CHORD (95% R, COND. NO. 55, HIGH ALT. STALL THRESHOLD,  $V_{true}=91$  KNOTS).

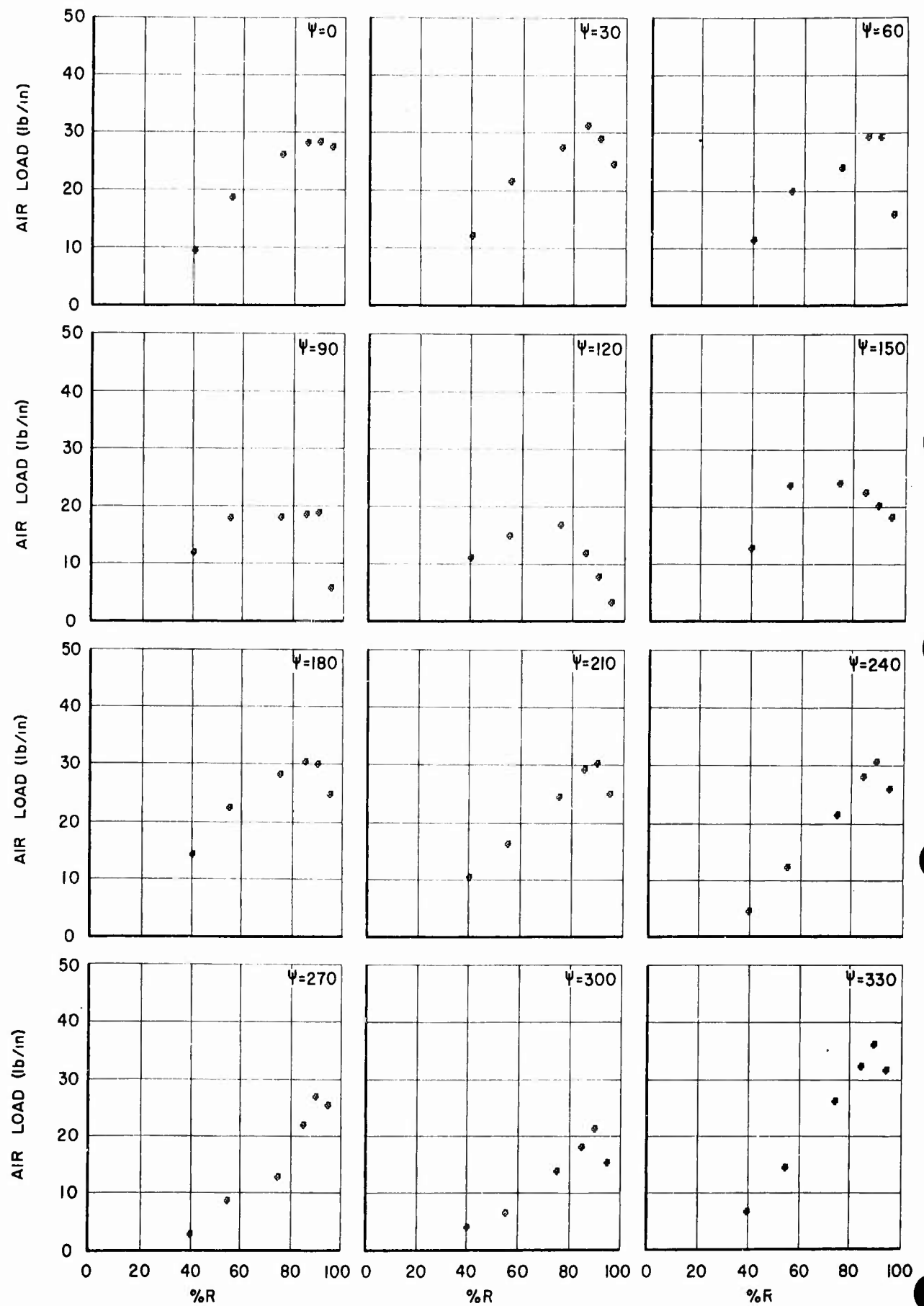


Figure 36g- AIR LOAD vs % RADIUS (COND.NO.55,HIGH ALT.STALL THRESHOLD, $V_{true}=91$ KNOTS).

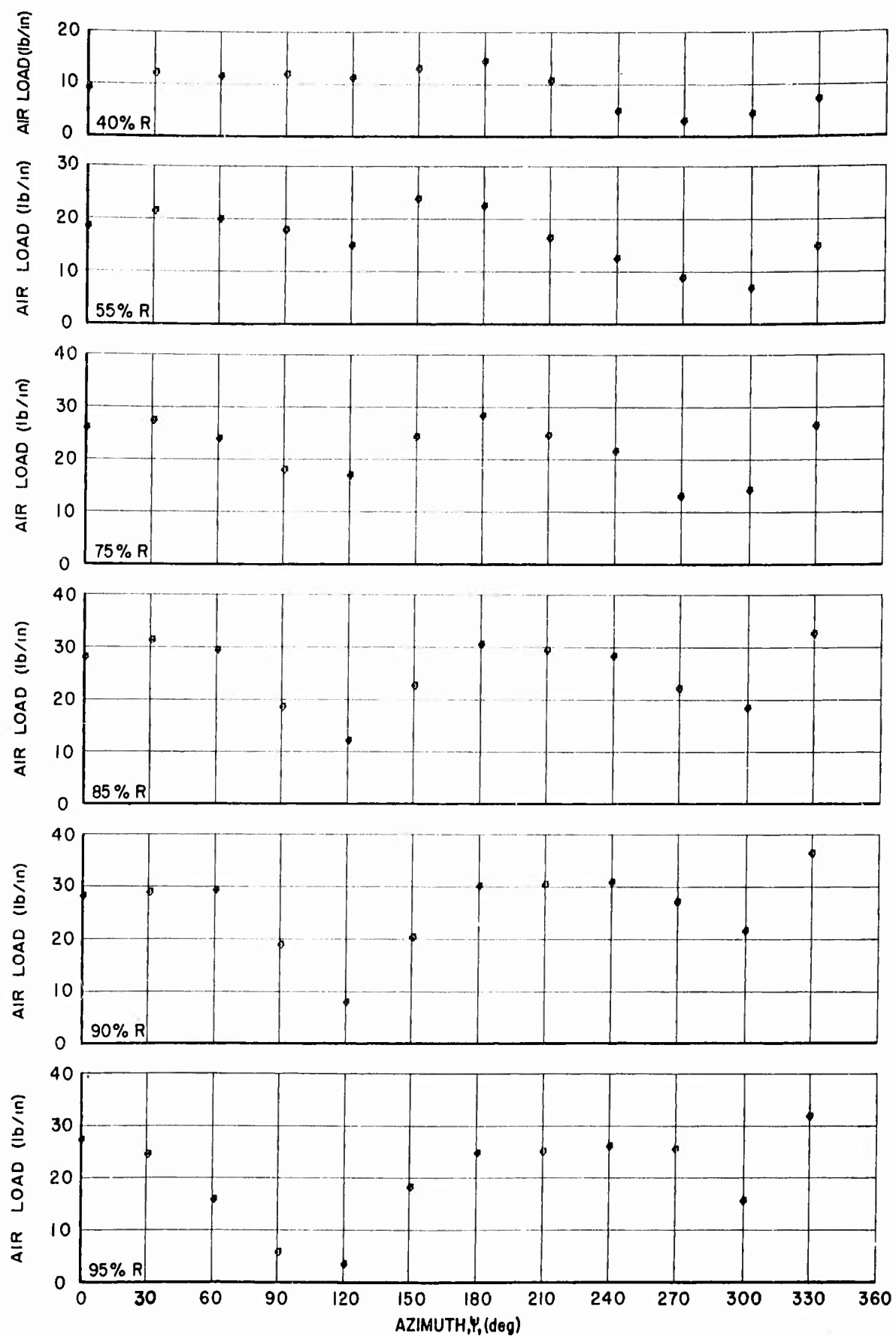


Figure 36h-AIR LOAD vs AZIMUTH (COND.NO.55,HIGH ALT.STALL THRESHOLD, $V_{true}=91$ KNOTS).

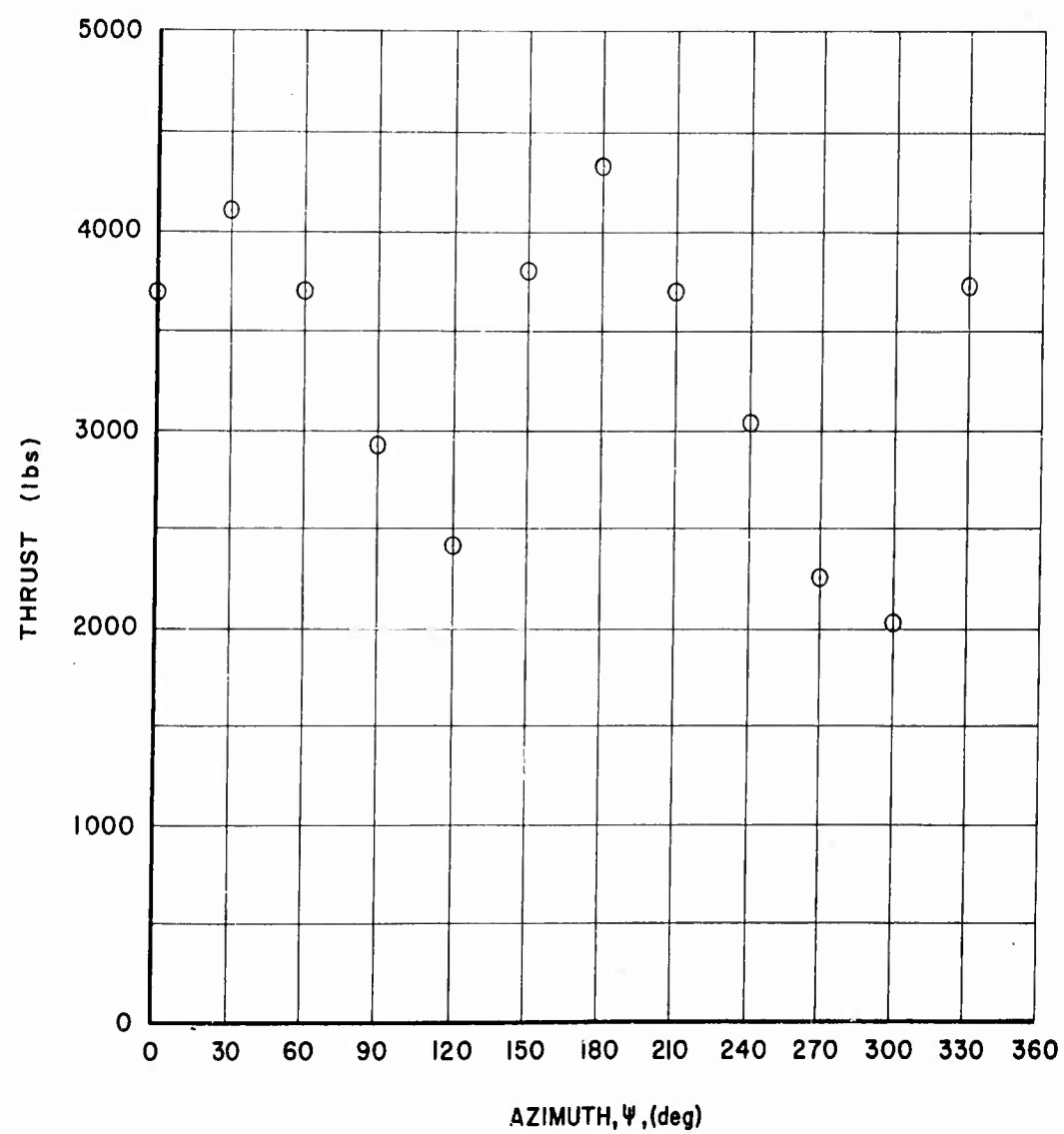


Figure 36i TOTAL THRUST/BLADE vs AZIMUTH  
(COND.NO.55,HIGH ALT.STALL THRESHOLD, $V_{true}=91$ KNOTS).

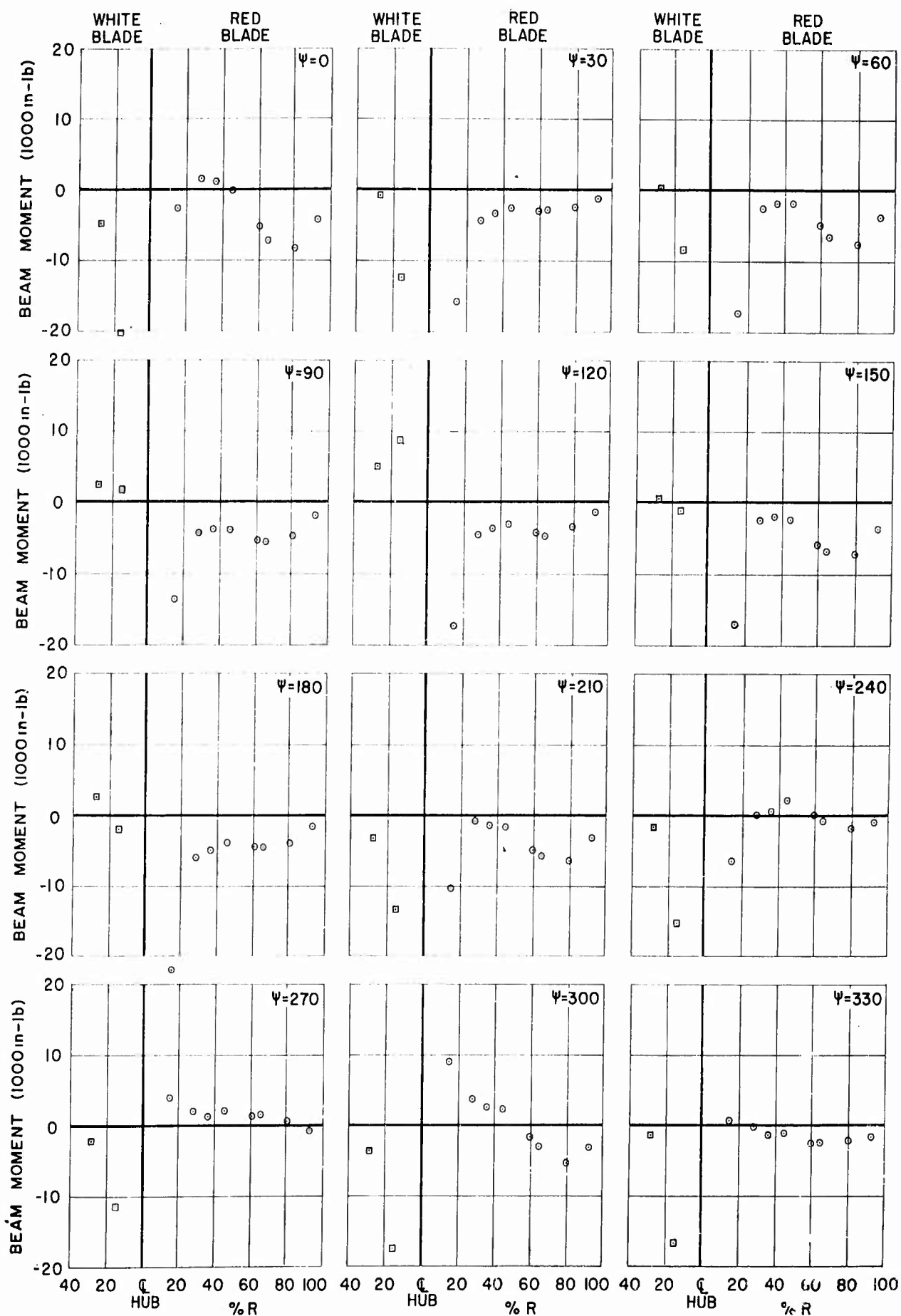


Figure 36j-BEAM MOMENT vs % RADIUS (COND.NO.55,HIGH ALT.STALL THRESHOLD, $V_{tr}=91$ KNOTS),  
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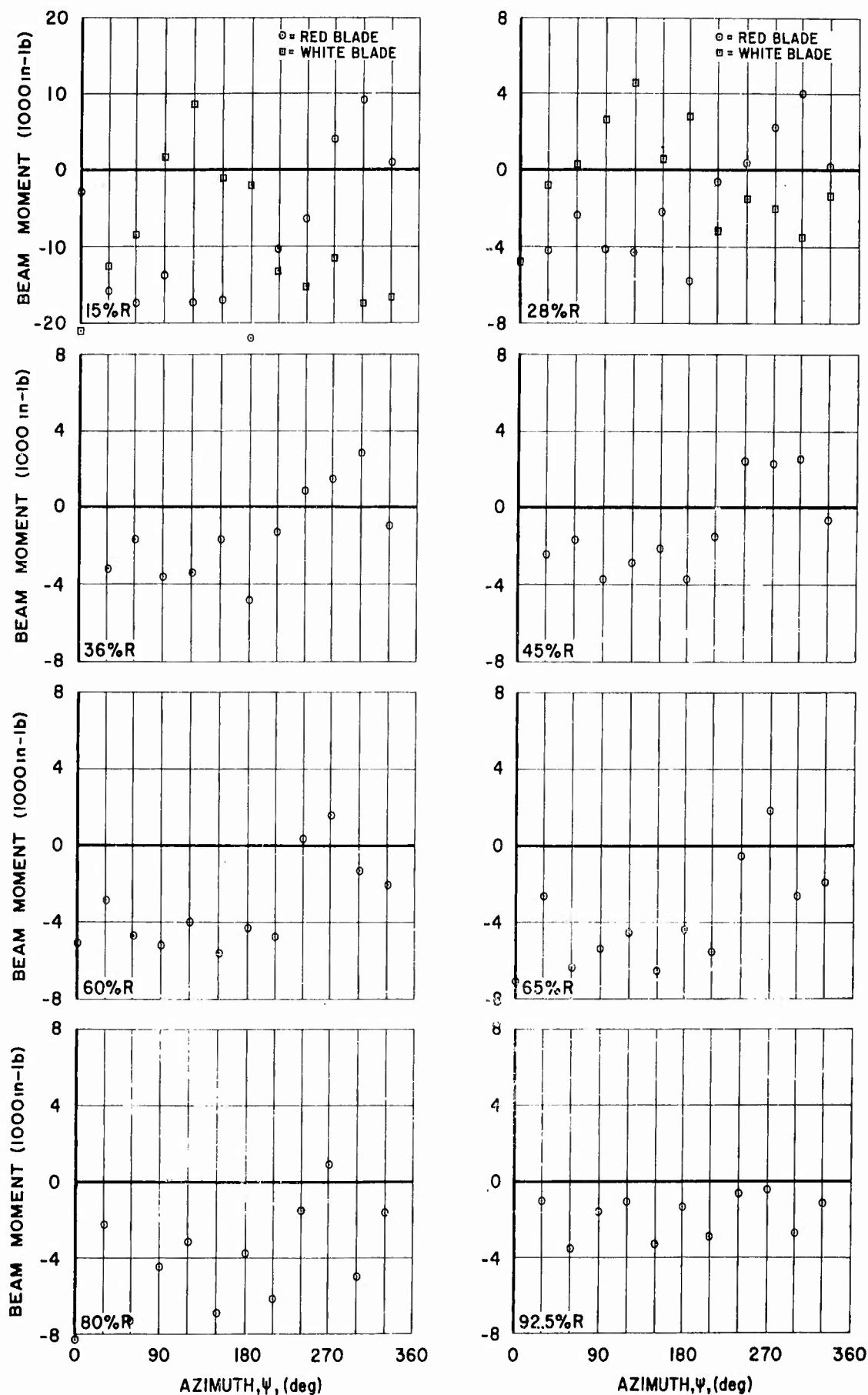


Figure 36k-BEAM MOMENT vs AZIMUTH (COND.NO).55,HIGH ALT.STALL THRESHOLD, $V_{true}=91$ KNOTS).

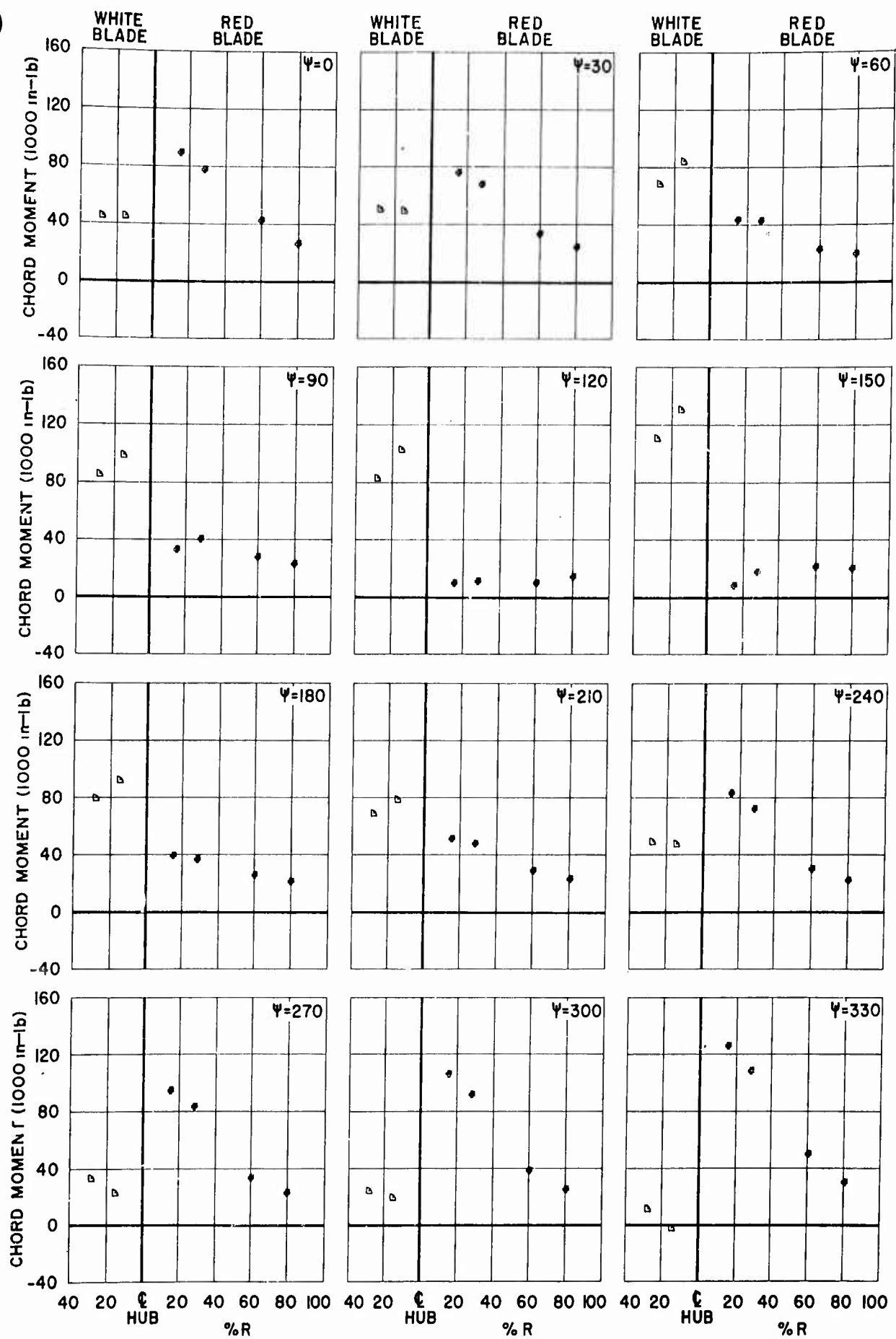


Figure 36m-CHORD MOMENT vs % RADIUS (COND.NO.55,HIGH ALT.STALL THRESHOLD,Vtrue=91KNOTS).

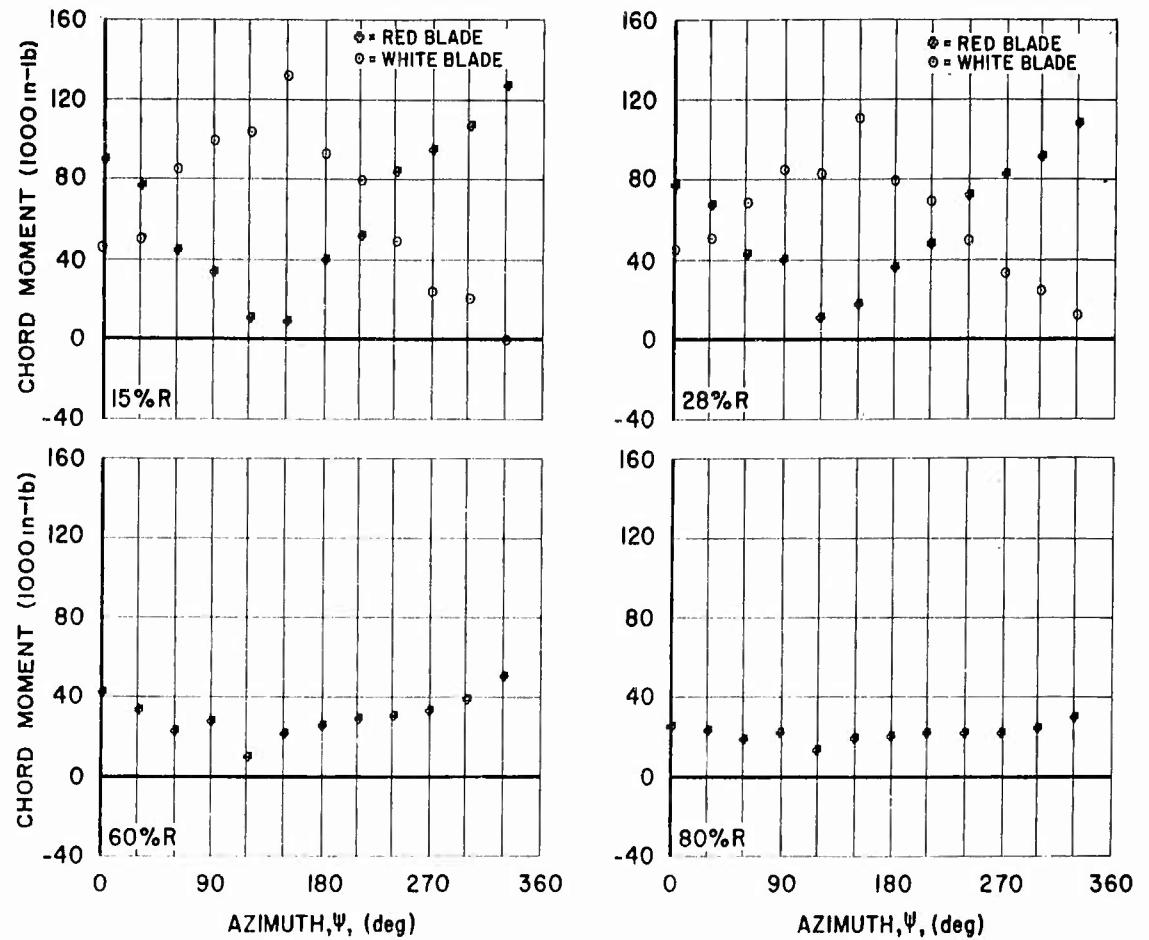


Figure 36n-CHORD MOMENT vs AZIMUTH (COND.NO.55,HIGH ALT.STALL THRESHOLD, $V_{true}=91$ KNOTS),

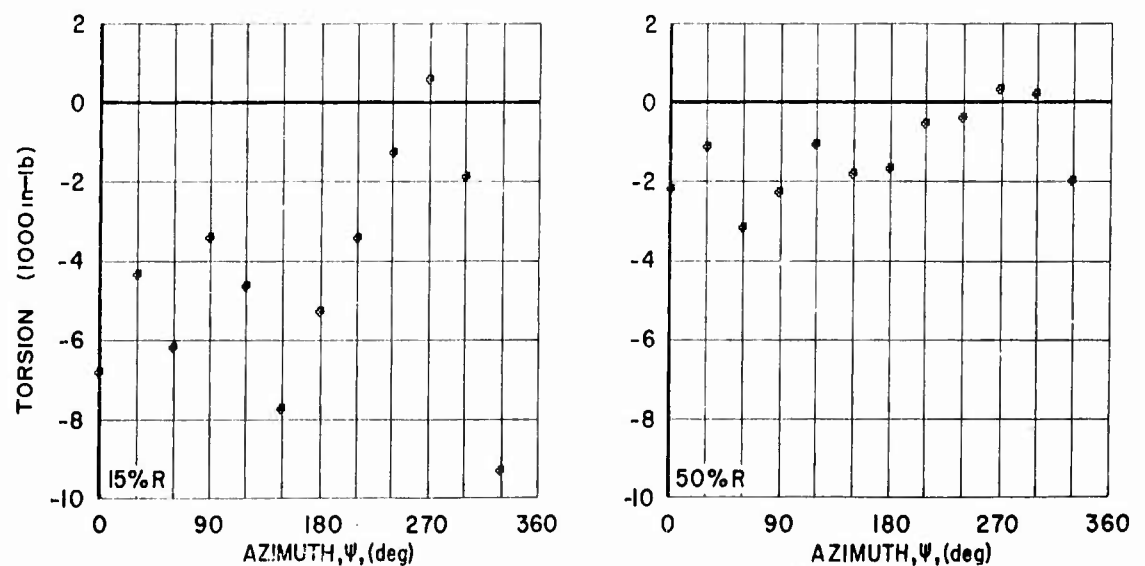


Figure 36o-TORSION vs AZIMUTH (COND.NO.55,HIGH ALT.STALL THRESHOLD, $V_{true}=91$ KNOTS),



FIGURE 37, GRAPHICAL DATA

TYPE I CONDITION NO. 58

HIGH ALTITUDE, BELOW STALL THRESHOLD, TRUE AIRSPEED = 79 KNOTS

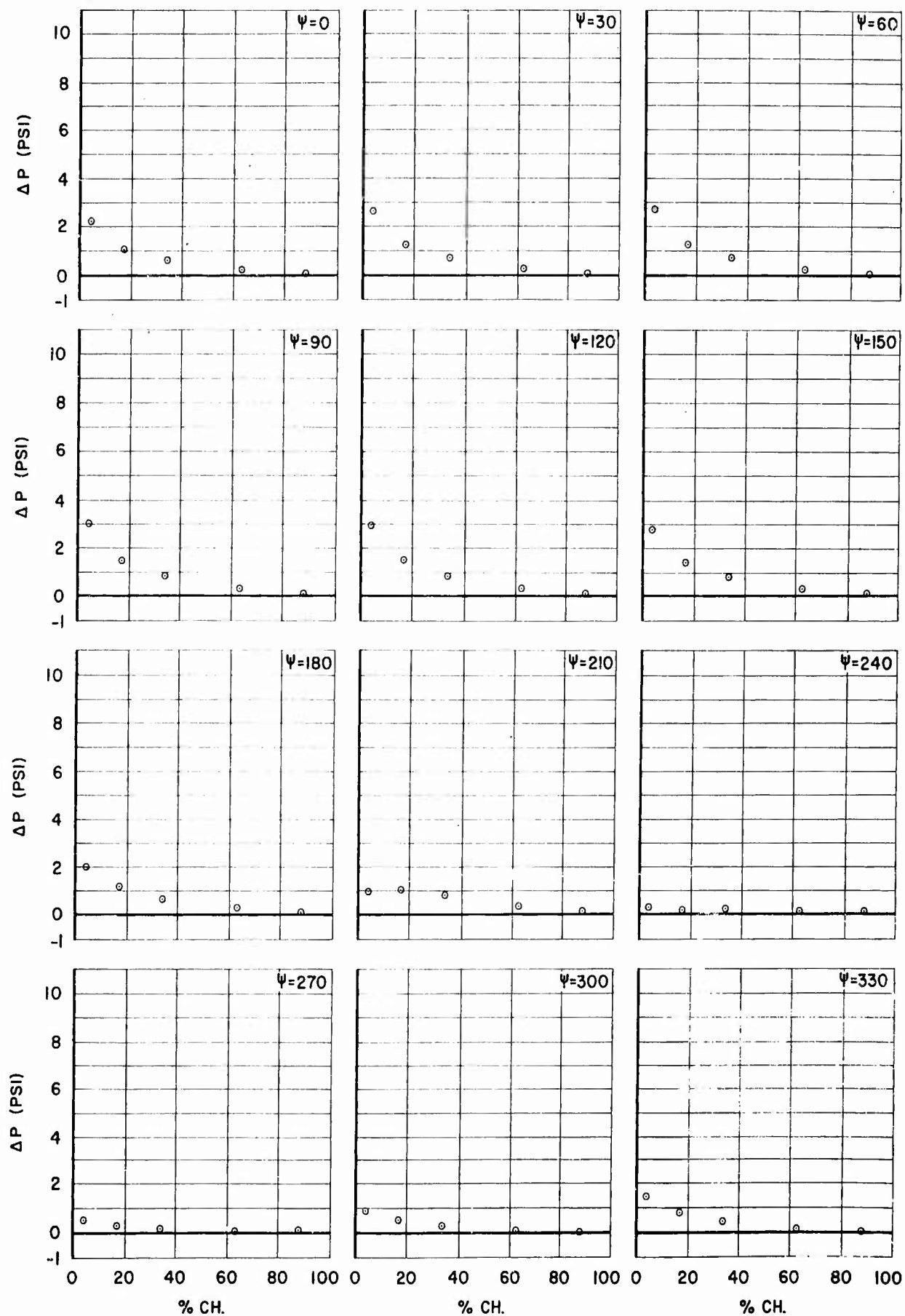


Figure 37a  $-\Delta P$  vs % CHORD (40% R, COND. NO. 58, HIGH ALT. FLIGHT,  $V_{true} = 79$  KNOTS).

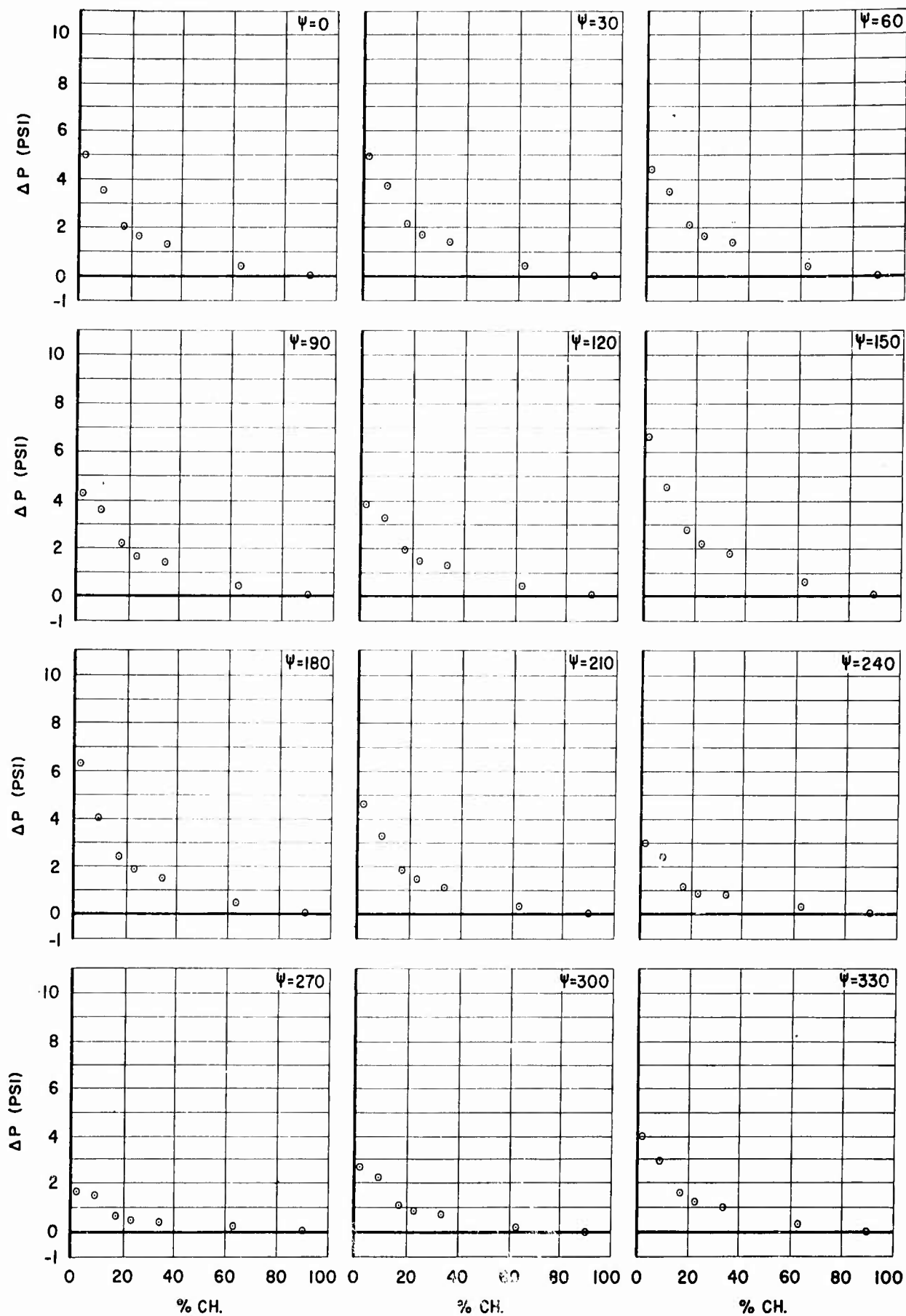


Figure 37b  $-\Delta P$  vs % CHORD (55% R, CCND. NO. 58, HIGH ALT. FLIGHT,  $V_{true} = 79$  KNOTS),

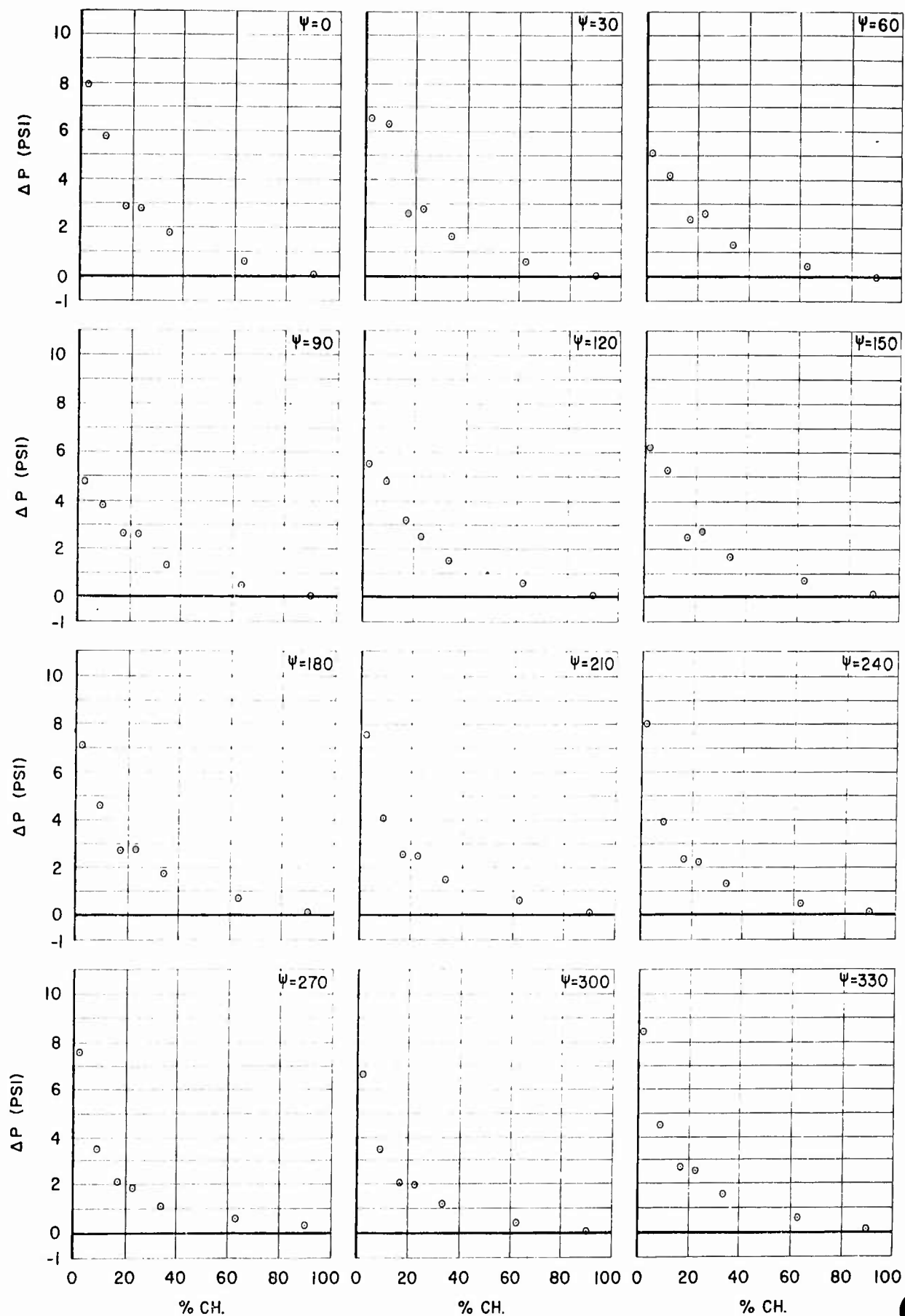


Figure 37c  $-\Delta P$  vs % CHORD (75% R, COND. NO. 58, HIGH ALT. FLIGHT,  $V_{true} = 79$  KNOTS).

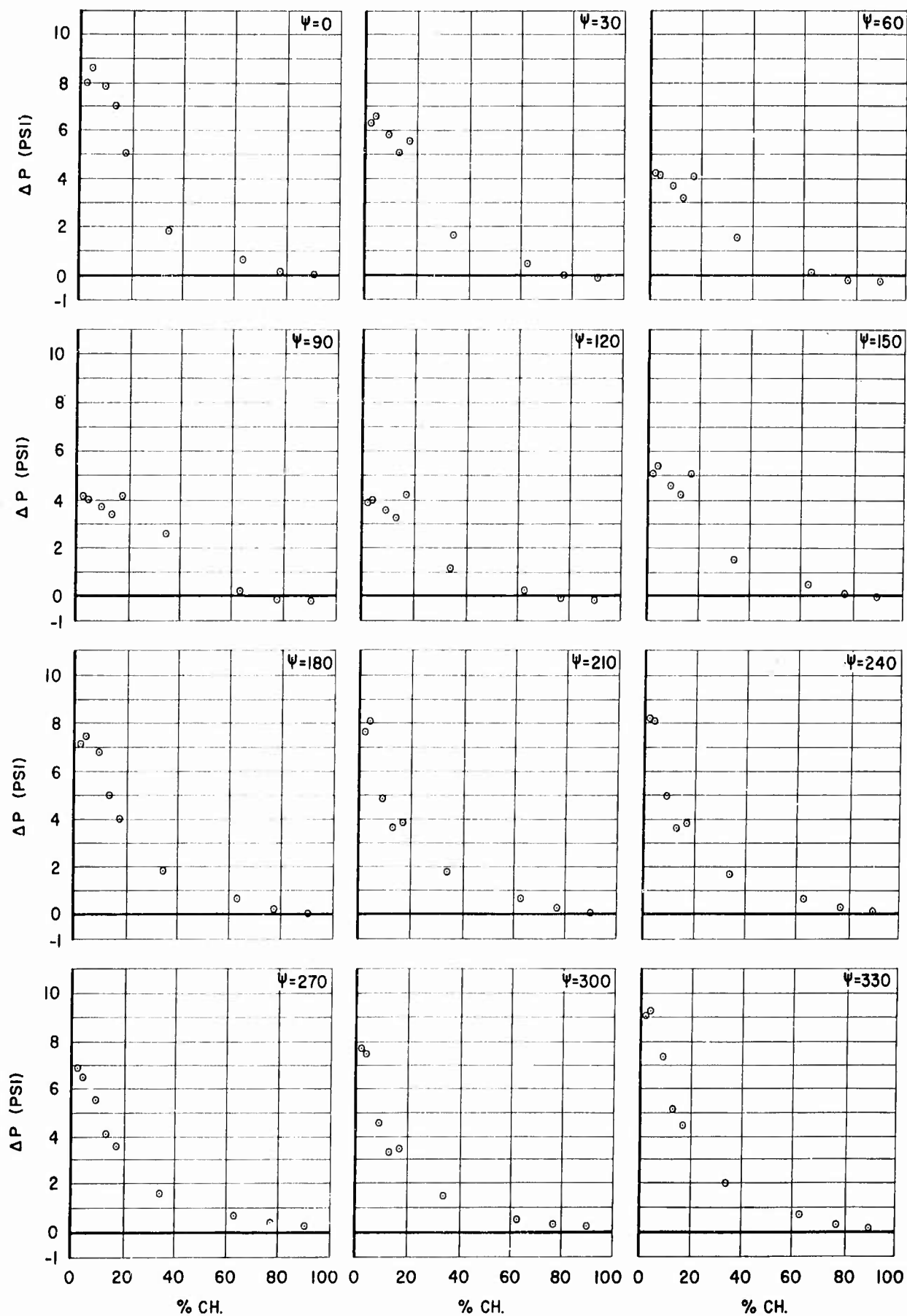


Figure 37d  $-\Delta P$  vs % CHORD (85% R, COND. NO. 58, HIGH ALT. FLIGHT,  $V_{true} = 79$  KNOTS).

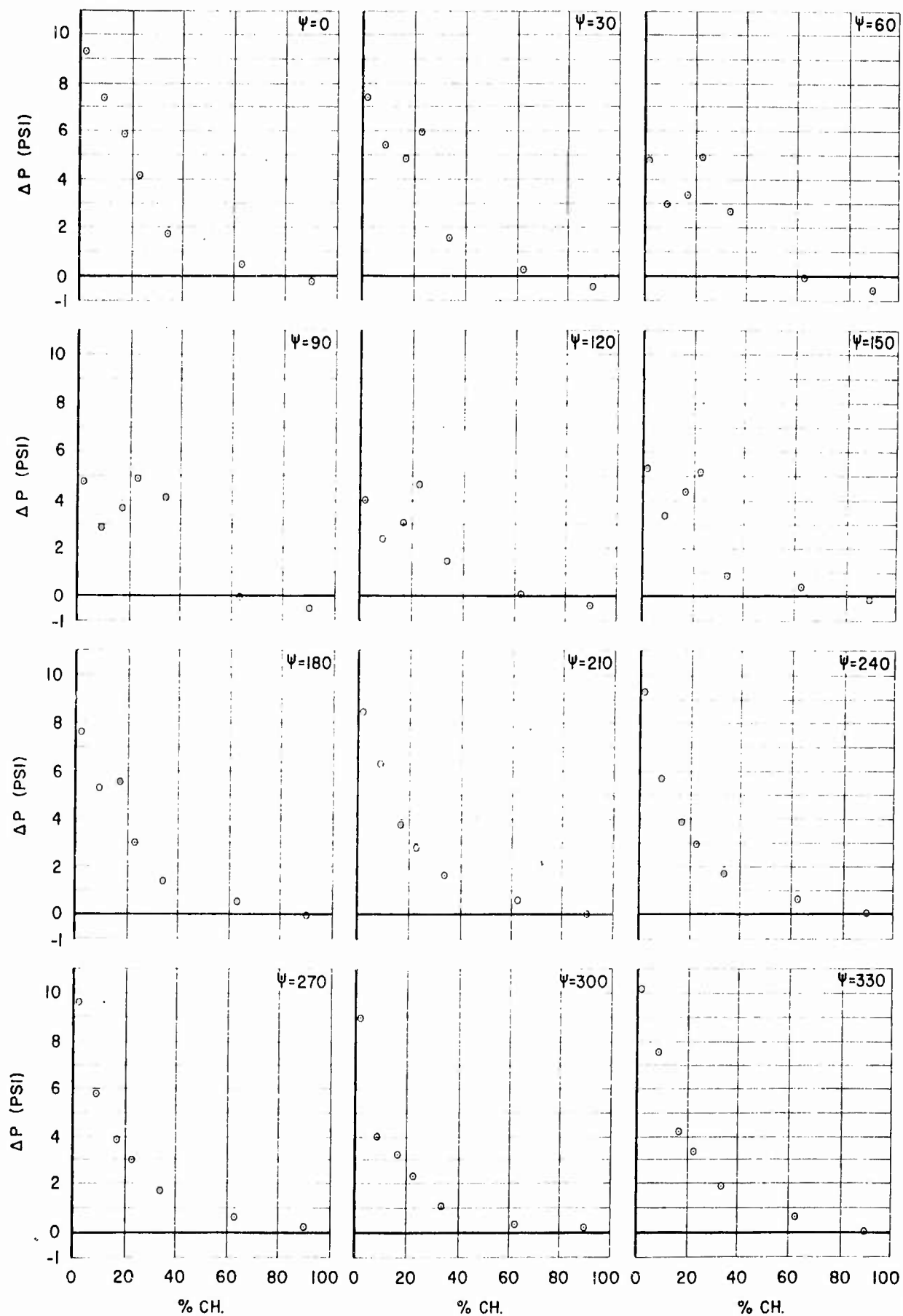


Figure 37c -  $\Delta P$  vs % CHORD (90° R, COND. NO. 58, HIGH ALT. FLIGHT,  $V_{true} = 79$  KNOTS).

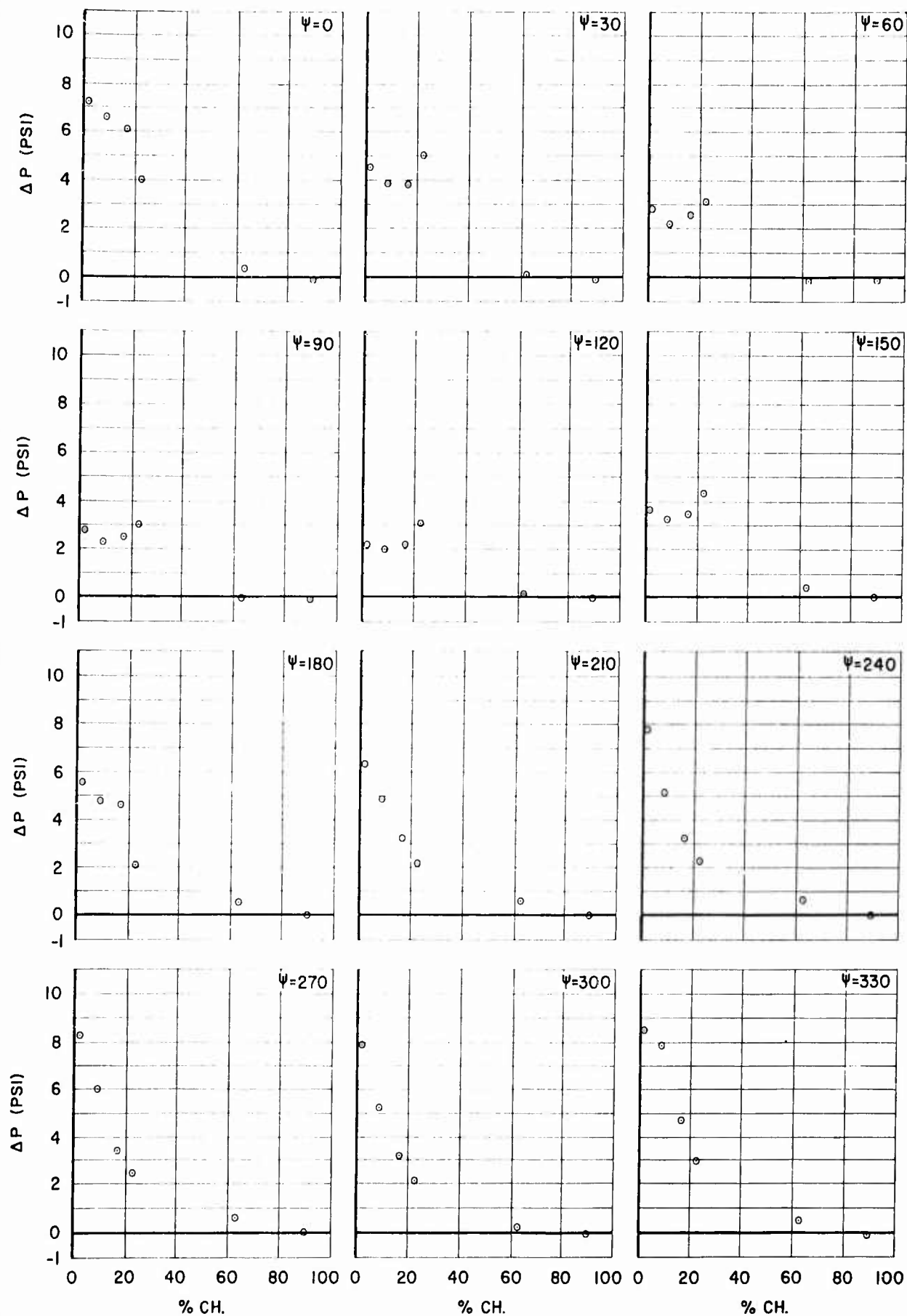


Figure 37f -  $\Delta P$  vs % CHORD (95% R, COND. NO. 58, HIGH ALT. FLIGHT,  $V_{true} = 79$  KNOTS),

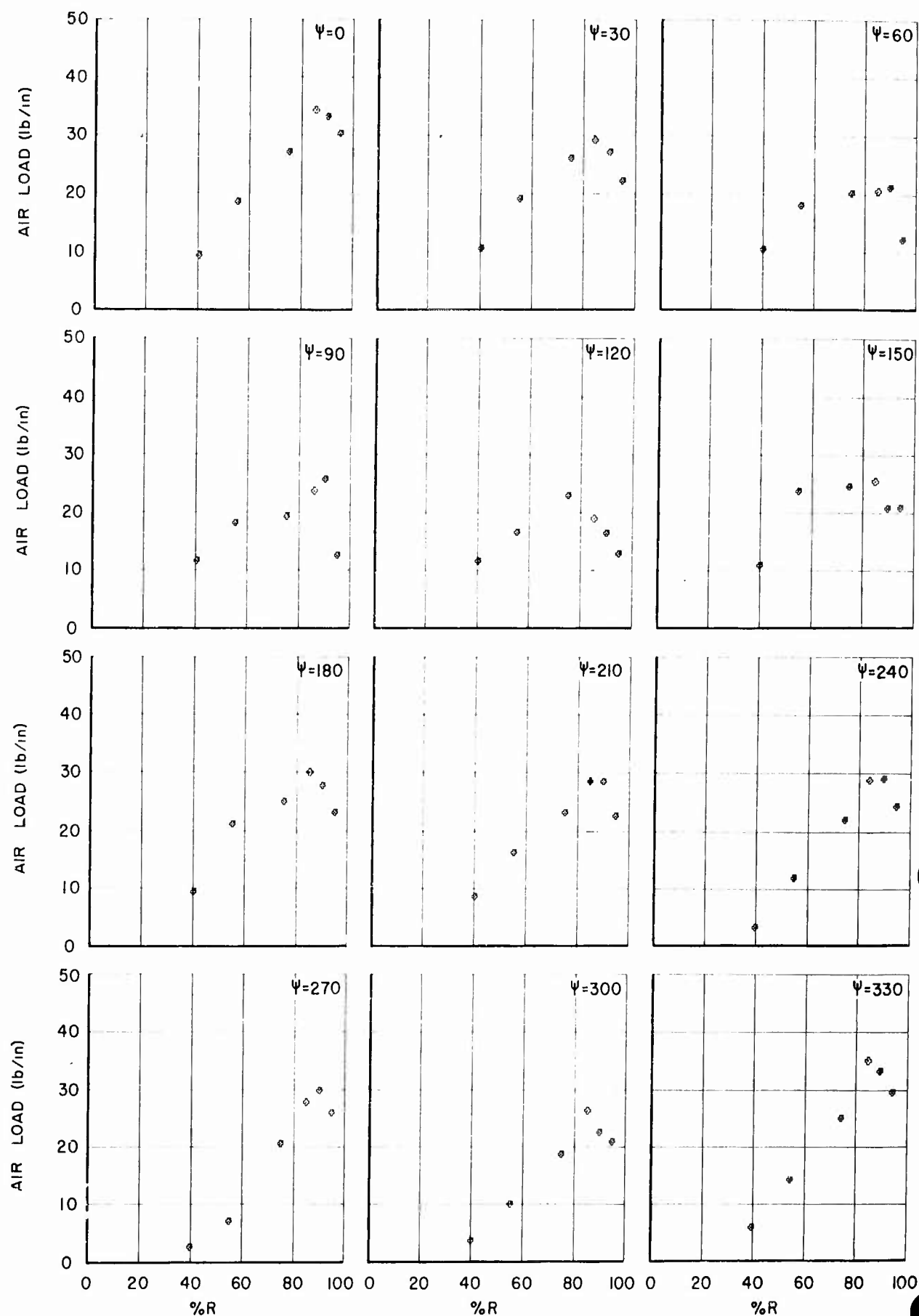


Figure 37g - AIR LOAD vs % RADIUS (COND.NO.58,HIGH ALT.FLIGHT, $V_{true} = 79$  KNOTS).



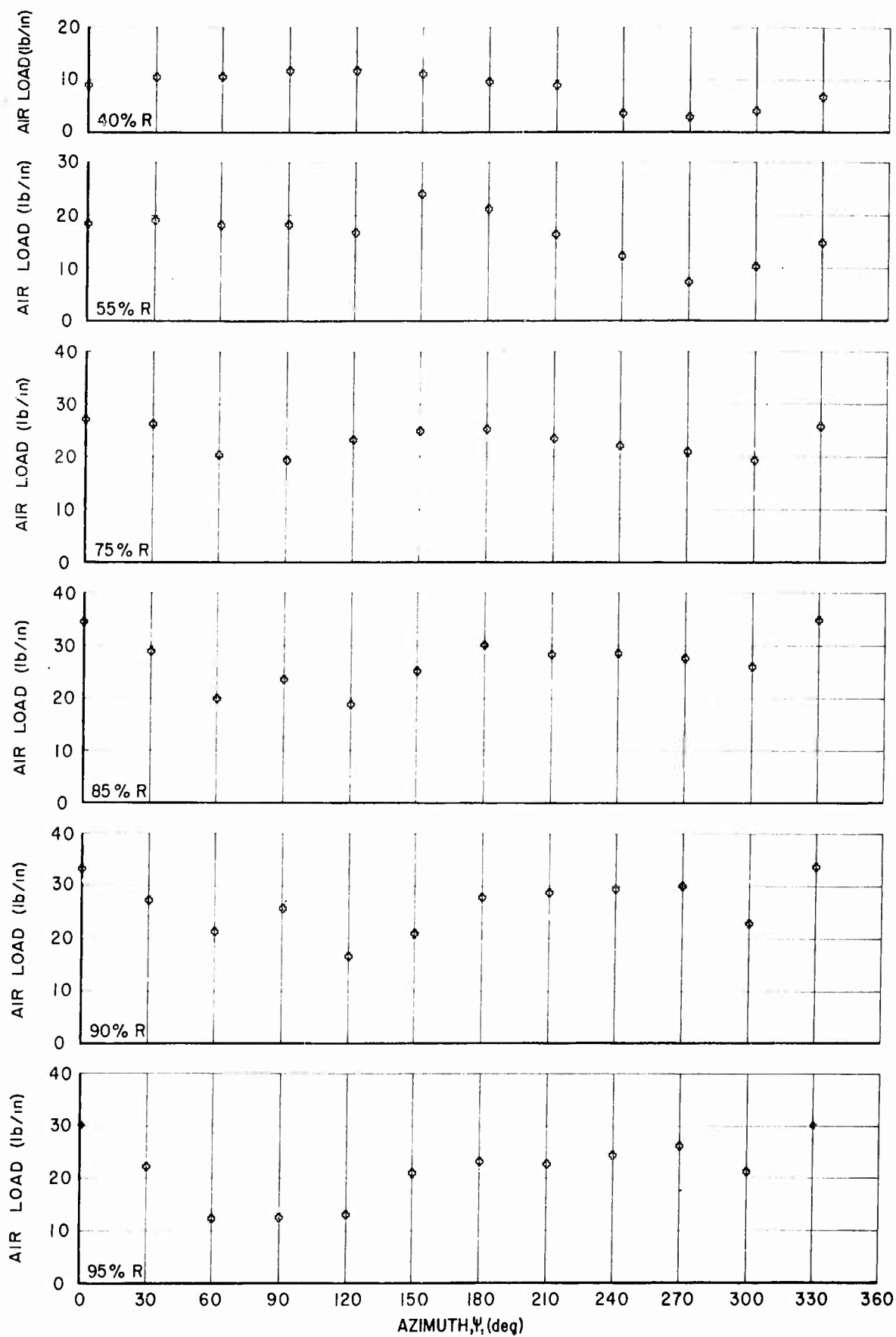


Figure 37h - AIR LOAD vs AZIMUTH (COND.NO.58,HIGH ALT. FLIGHT, $V_{true} = 79$  KNOTS).

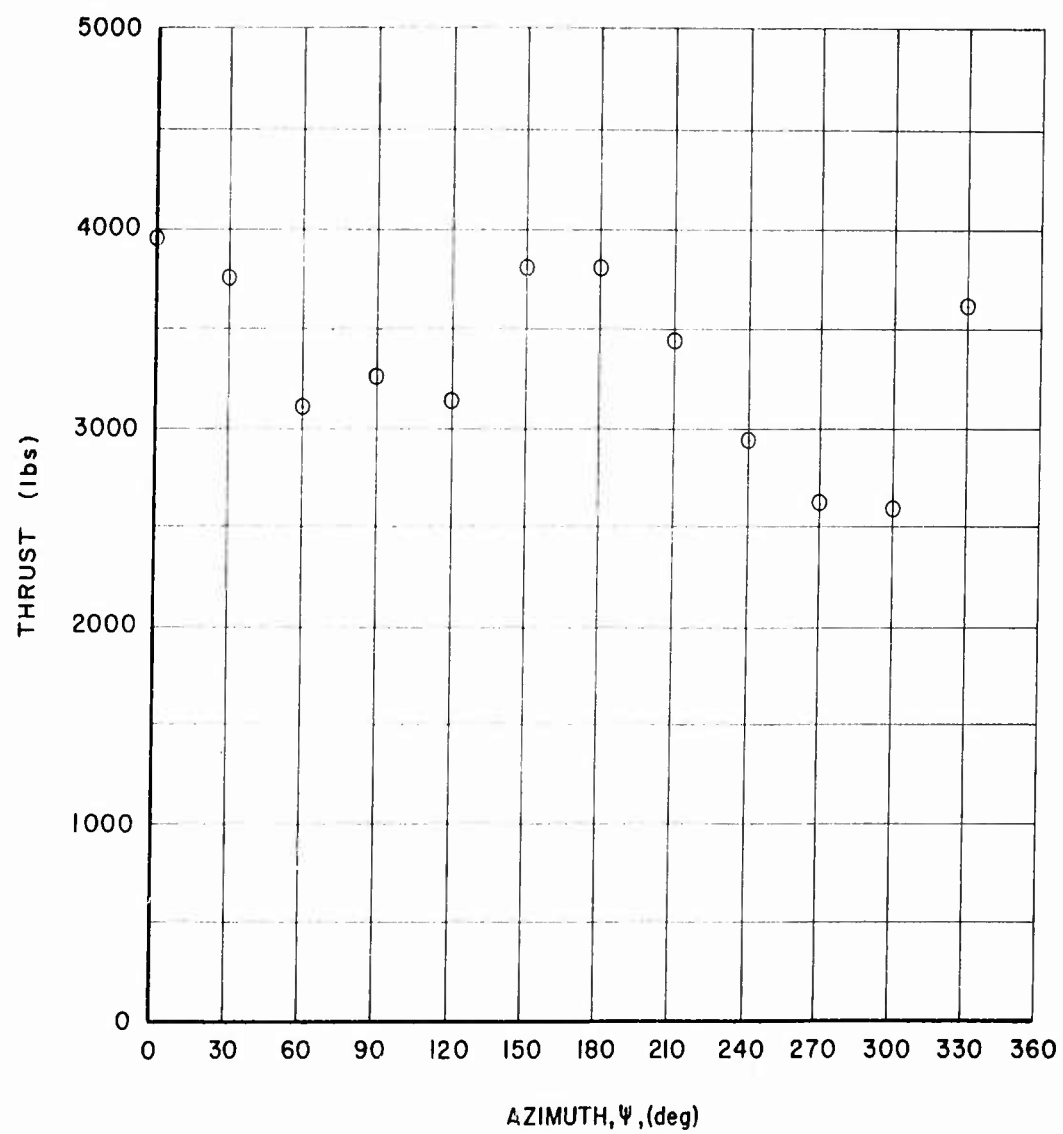


Figure 37i TOTAL THRUST/BLADE vs AZIMUTH  
(COND.NO.58,HIGH ALT.FLIGHT, $V_{true}=79$  KNOTS)

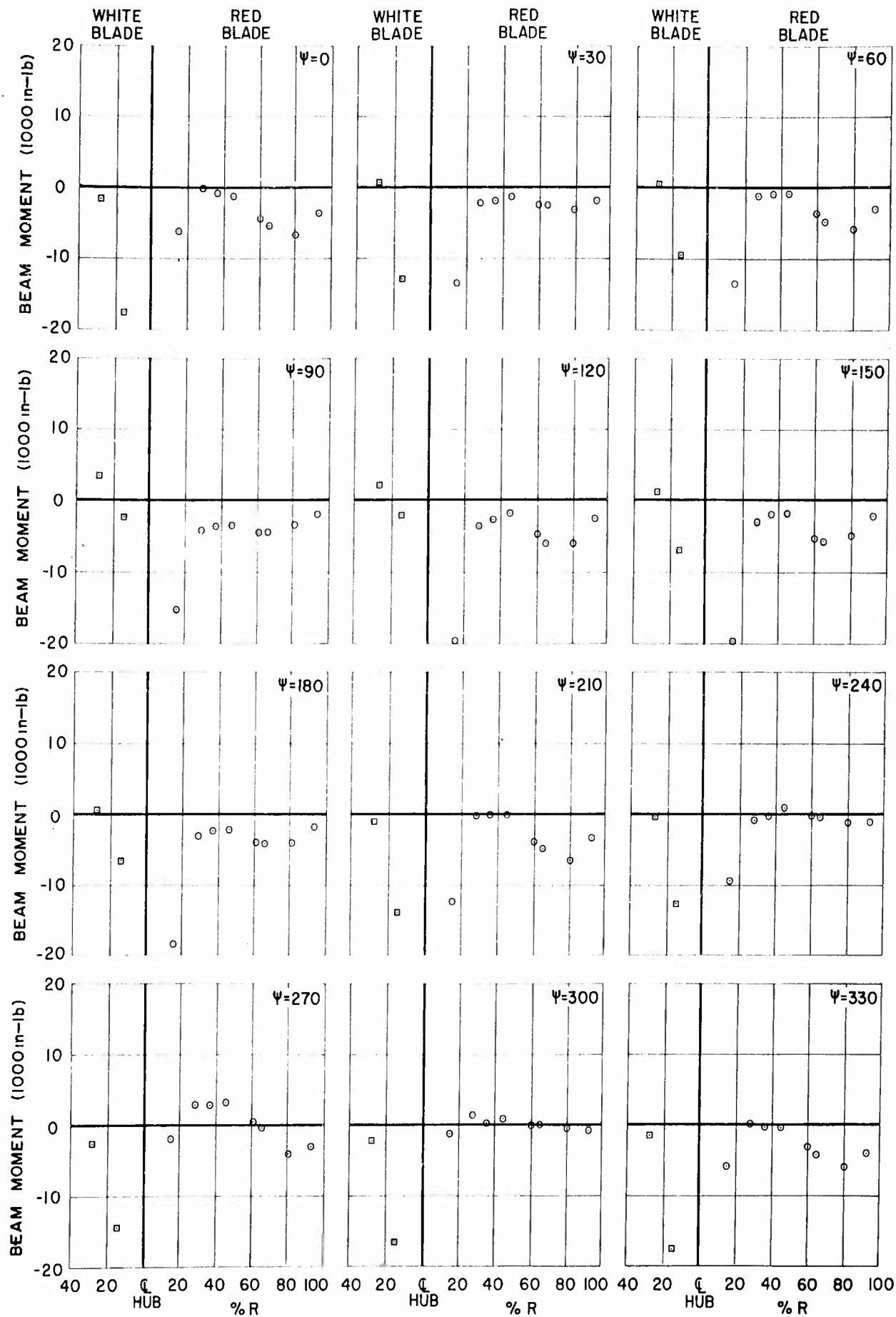


Figure 37j - BEAM MOMENT vs % RADIUS (COND.NO.58, HIGH ALT.FLIGHT,  $v_{true} = 79$  KNOTS),

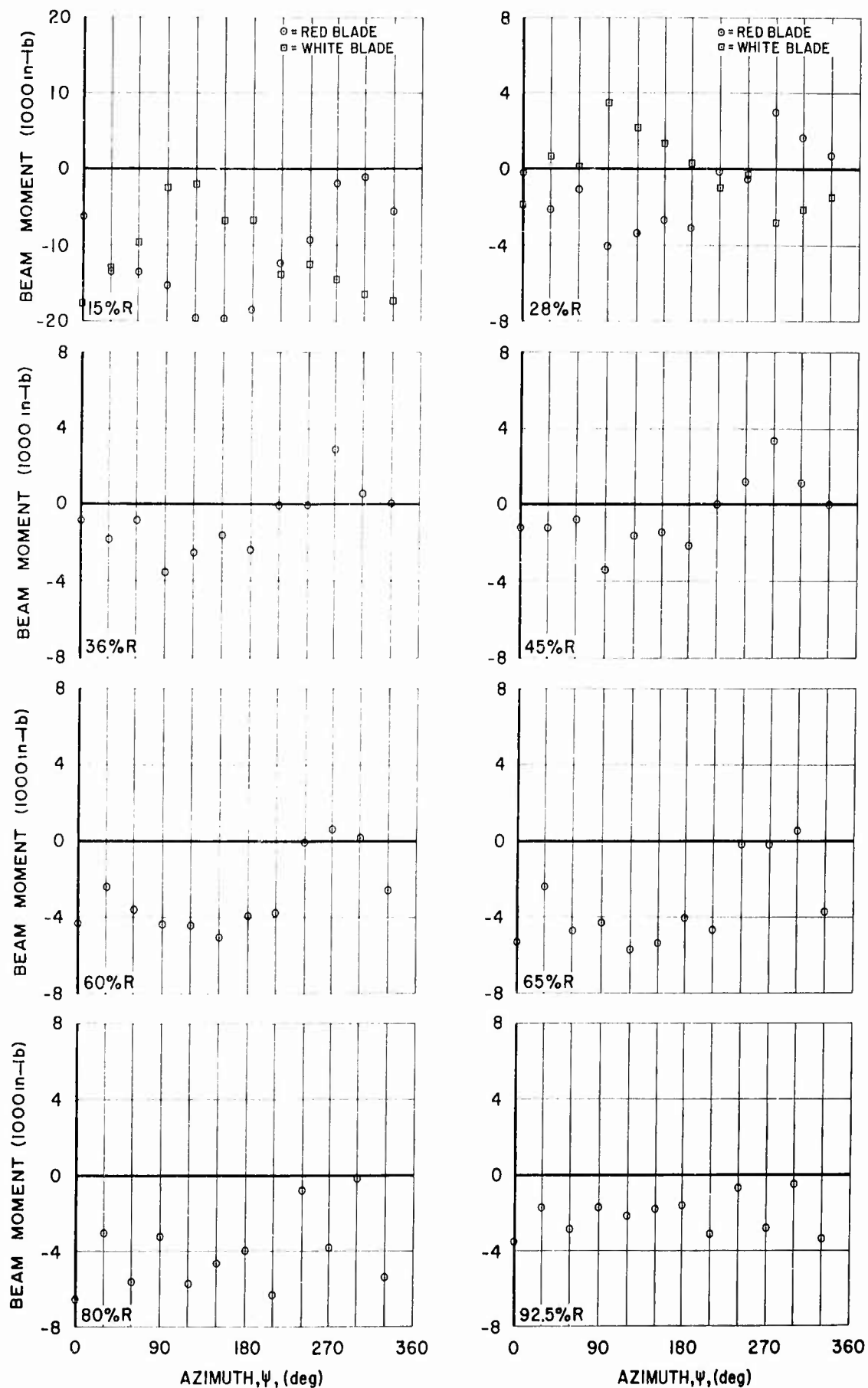


Figure 37k - BEAM MOMENT vs AZIMUTH (COND.NO.58,HIGH ALT.FLIGHT,Vtrue=79 KNOTS),

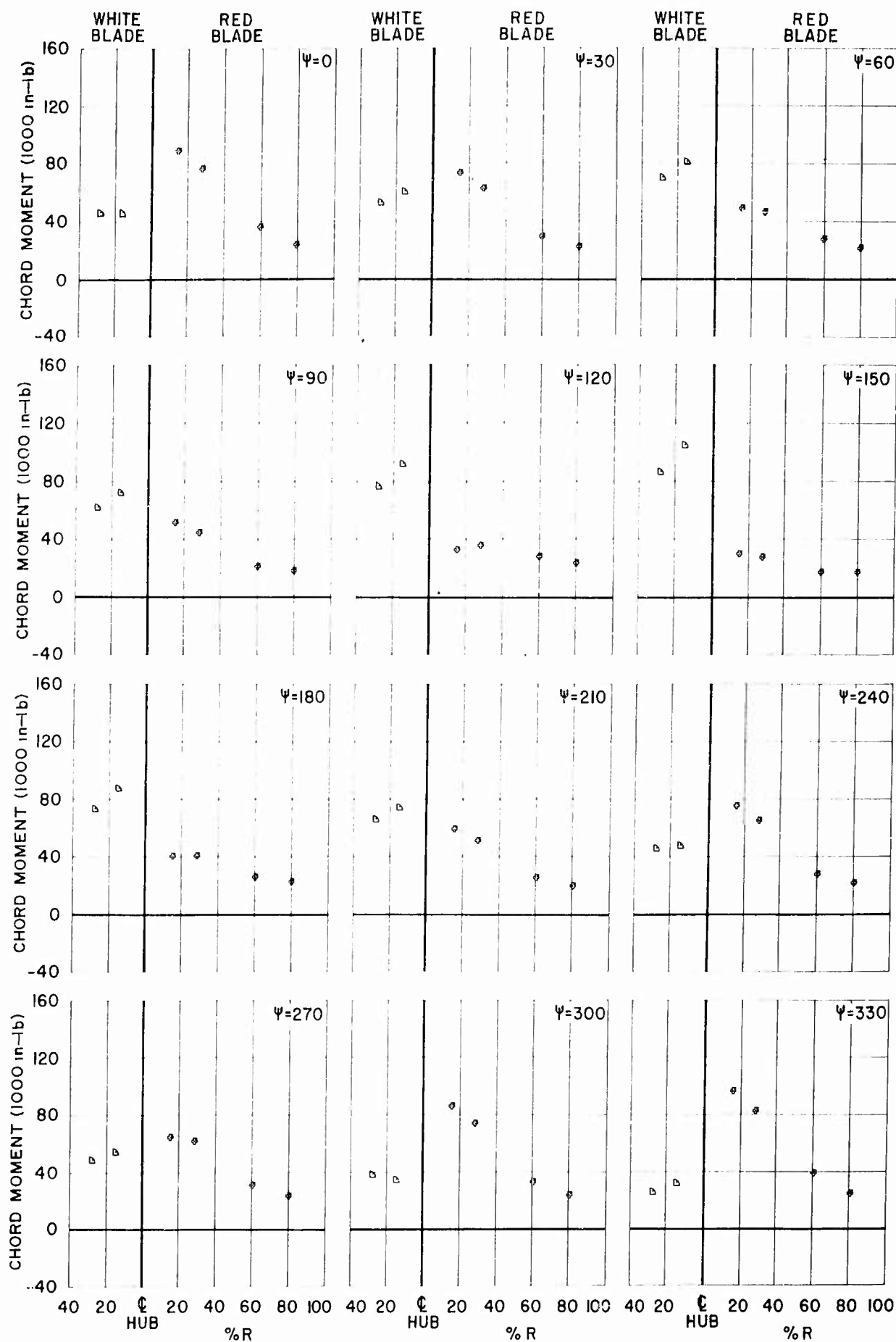


Figure 37m - CHORD MOMENT vs % RADIUS (COND. NO. 58, HIGH ALT. FLIGHT,  $V_{true} = 79$  KNOTS),

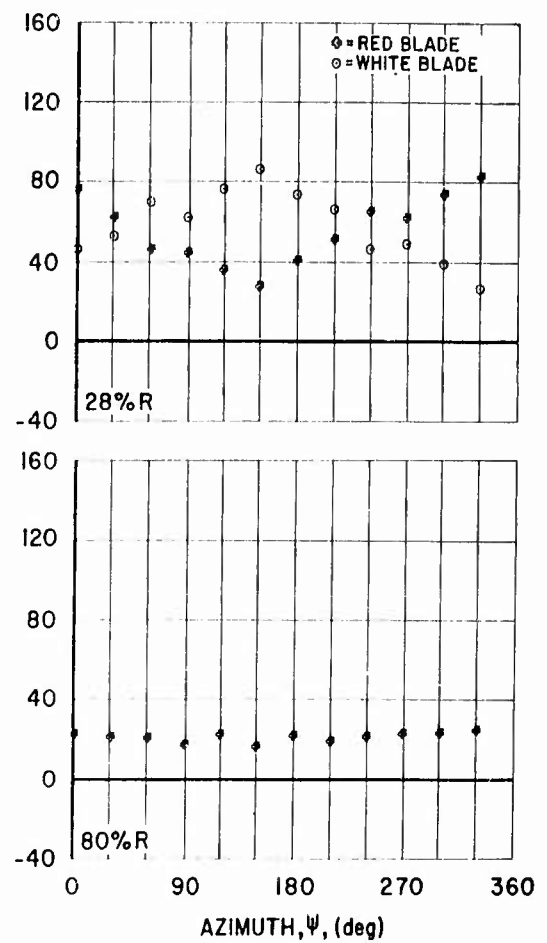
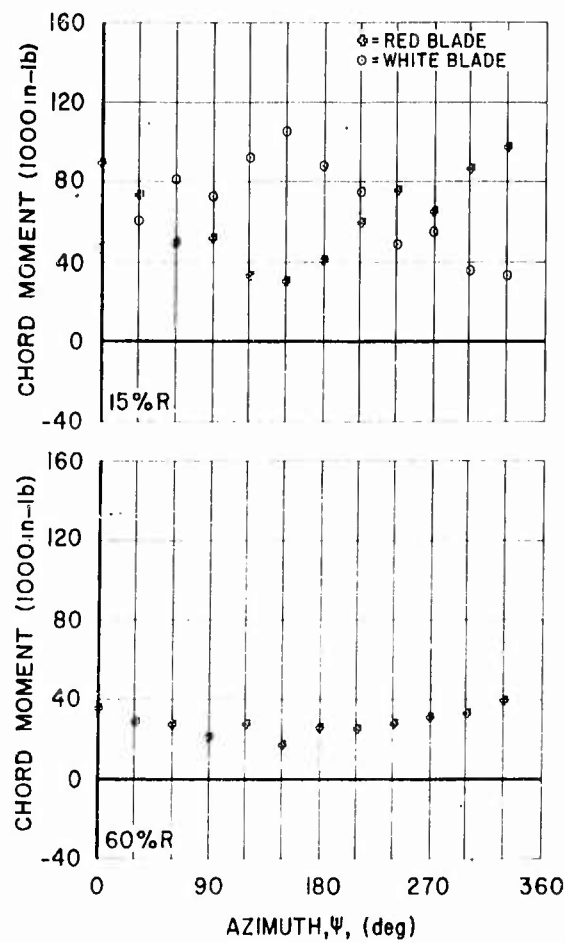


Figure 37n - CHORD MOMENT vs AZIMUTH (COND.NO.58,HIGH ALT.FLIGHT, $V_{true}=79$  KNOTS).

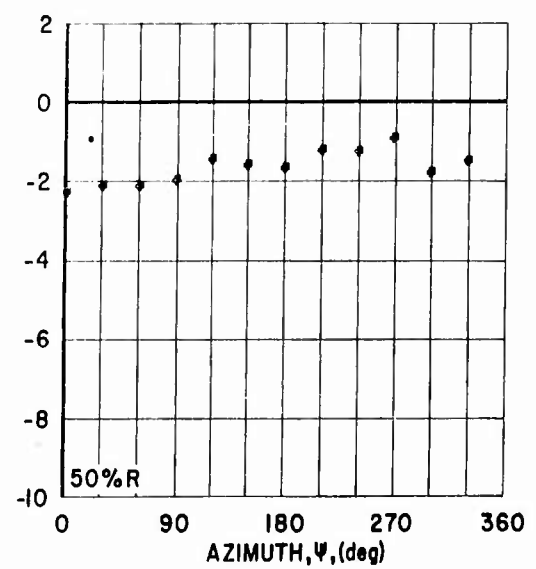
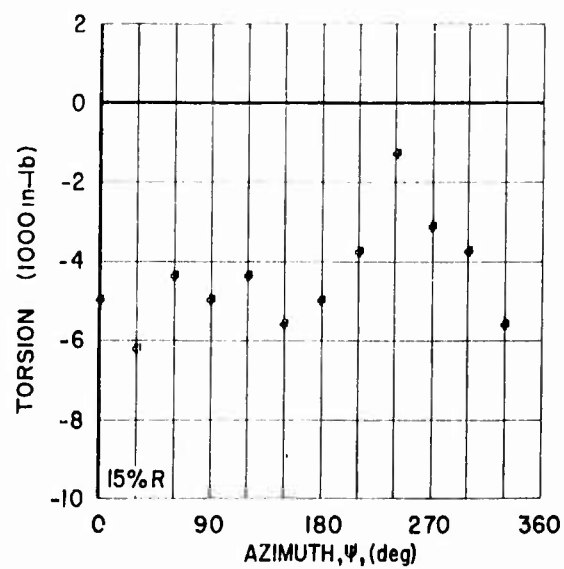


Figure 37o - TORSION vs AZIMUTH (COND.NO.58,HIGH ALT.FLIGHT, $V_{true} = 79$  KNOTS).

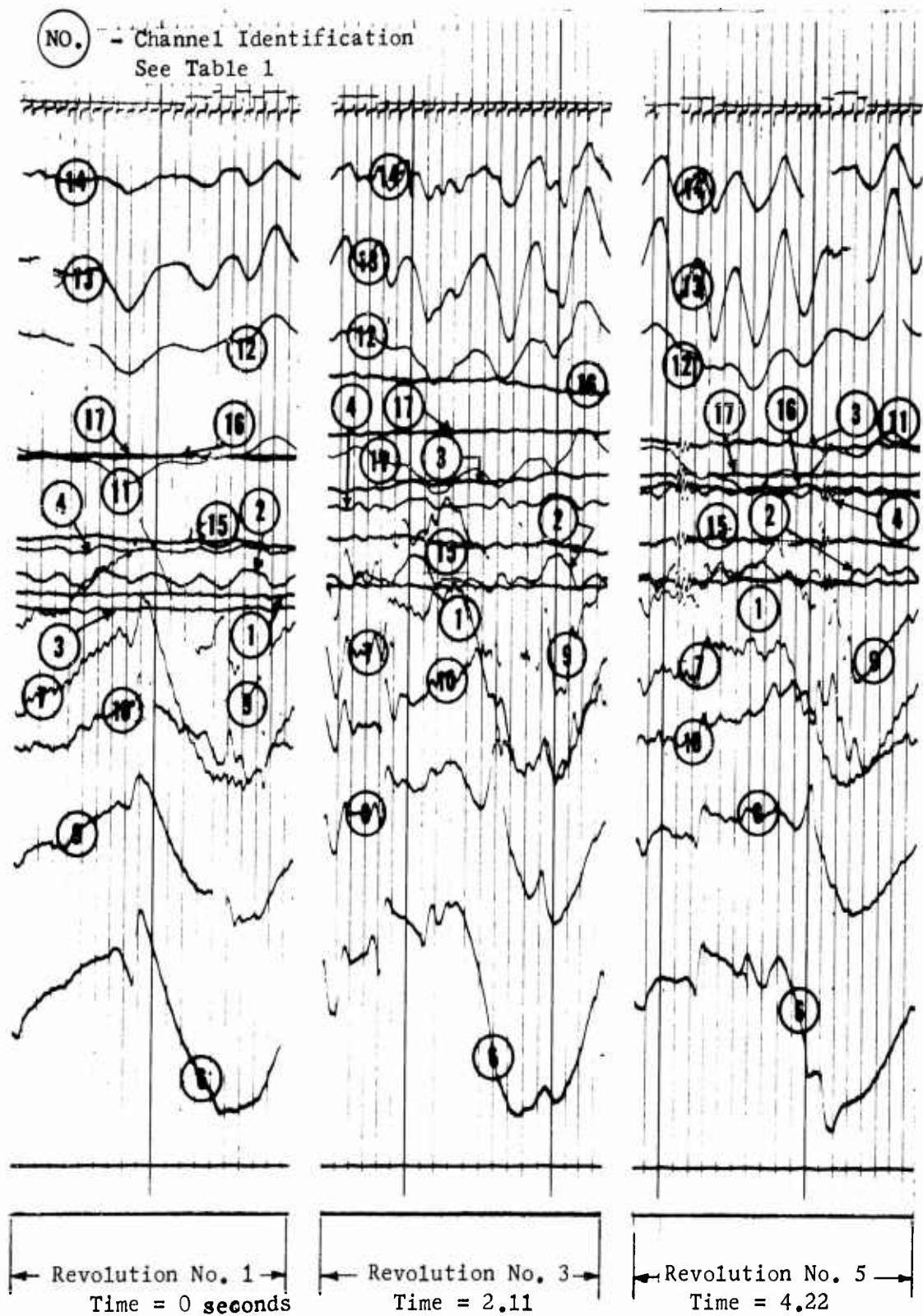


FIGURE 38a - THREE ROTOR REVOLUTIONS OSCILLOGRAPH NO. 1  
CONDITION NO. 34, SYMMETRICAL PULL-UP.

NO. - Channel Identification  
See Table 1

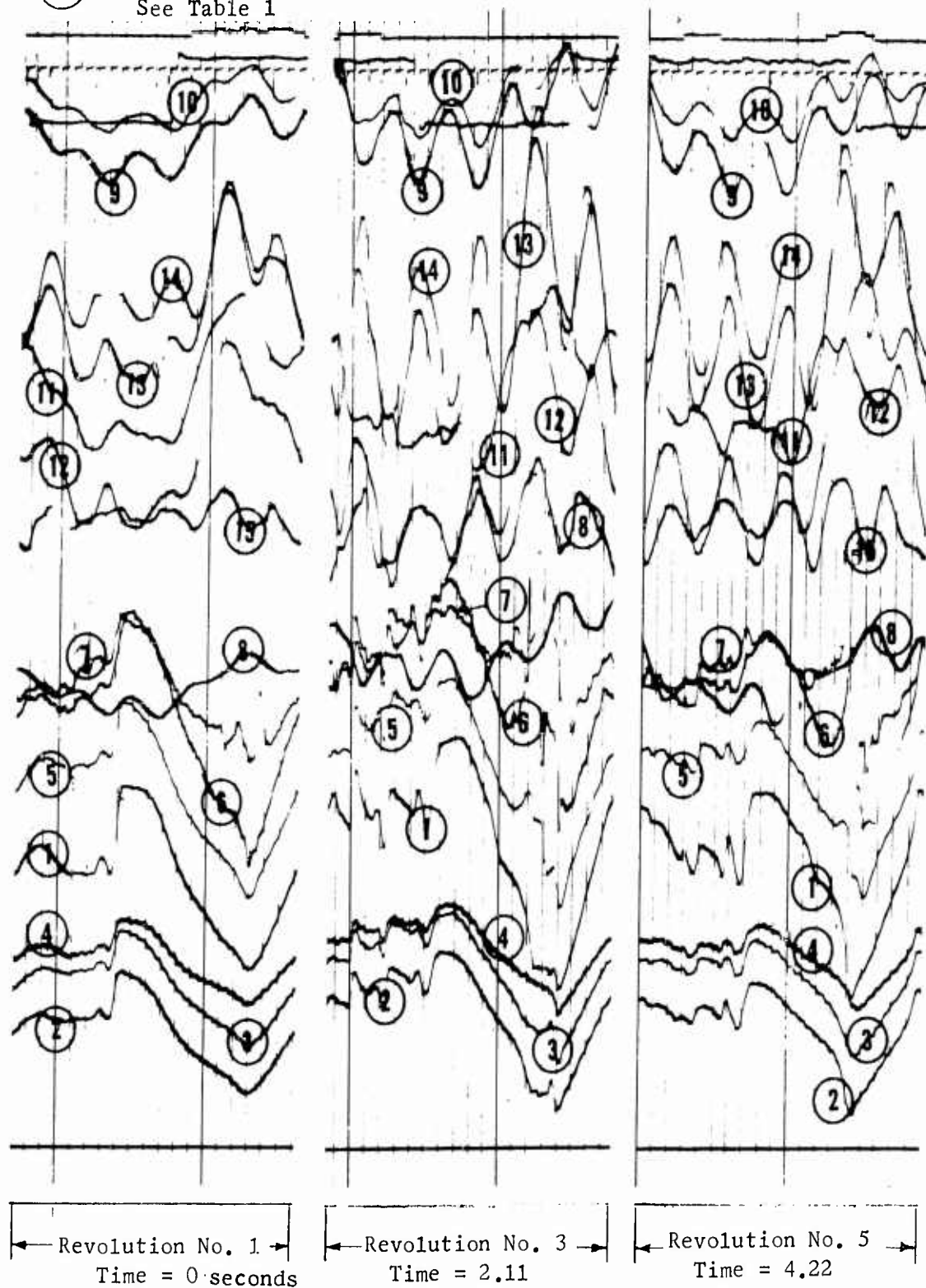


FIGURE 38b - THREE ROTOR REVOLUTIONS OSCILLOGRAPH NO. 2  
CONDITION NO. 34, SYMMETRICAL PULL-UP.



NO. - Channel Identification  
See Table 1

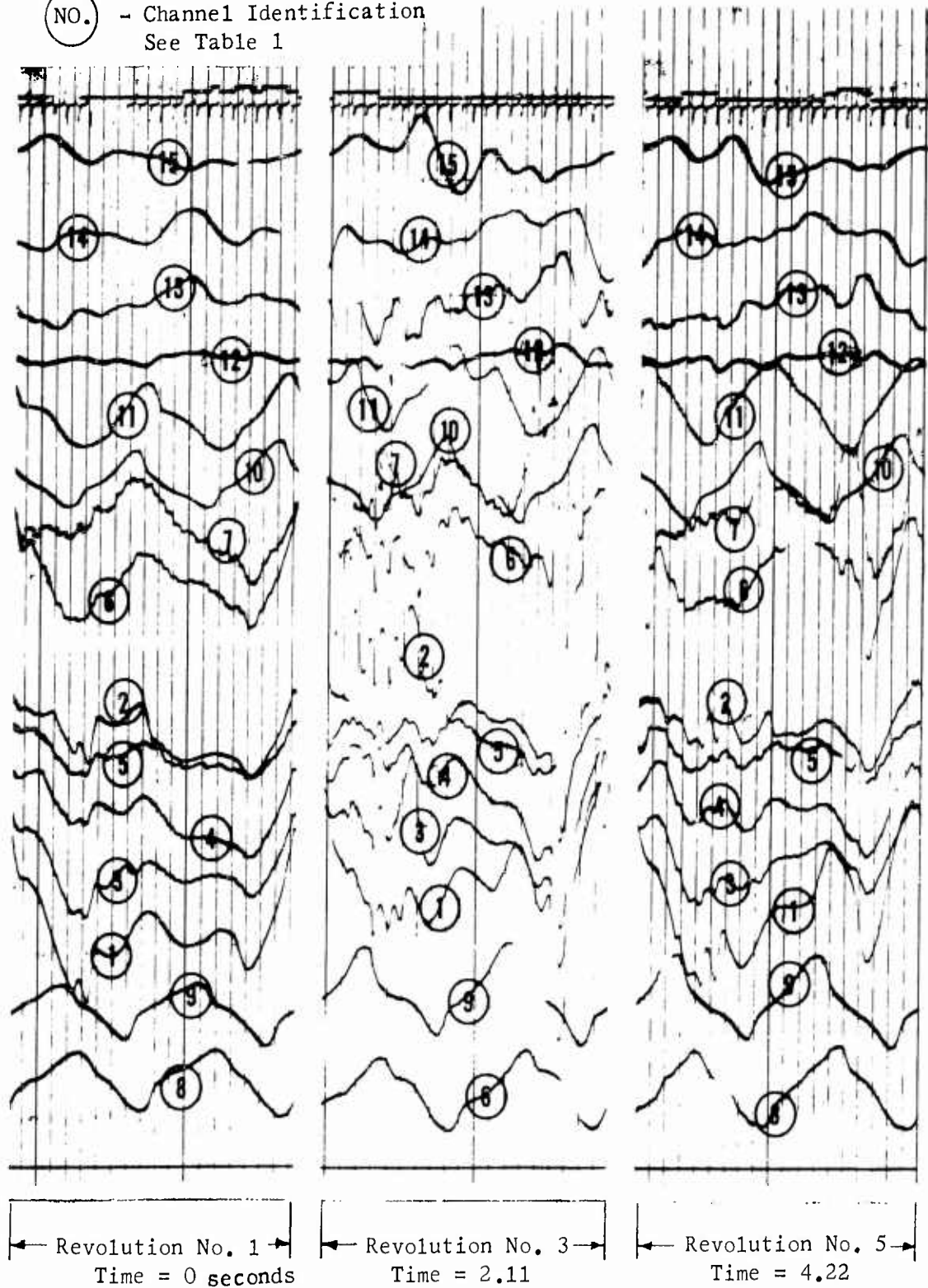


FIGURE 38c - THREE ROTOR REVOLUTIONS OSCILLOGRAPH NO. 3  
CONDITION NO. 34, SYMMETRICAL PULL-UP.

NO. - Channel Identification  
See Table 1

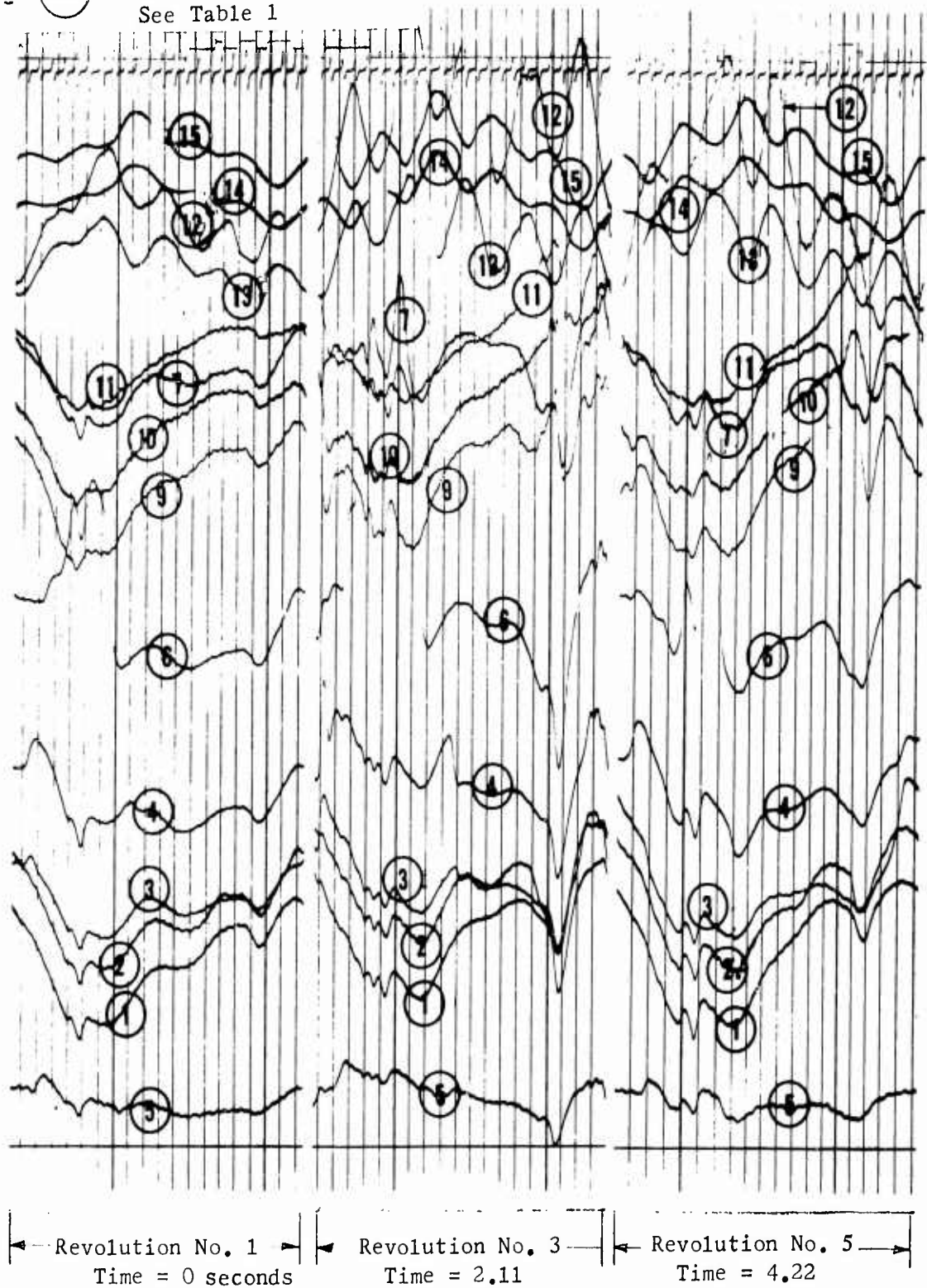


FIGURE 38d - THREE ROTOR REVOLUTIONS OSCILLOGRAPH NO. 4  
CONDITION NO. 34, SYMMETRICAL PULL-UP.

NO. - Channel Identification  
See Table 1

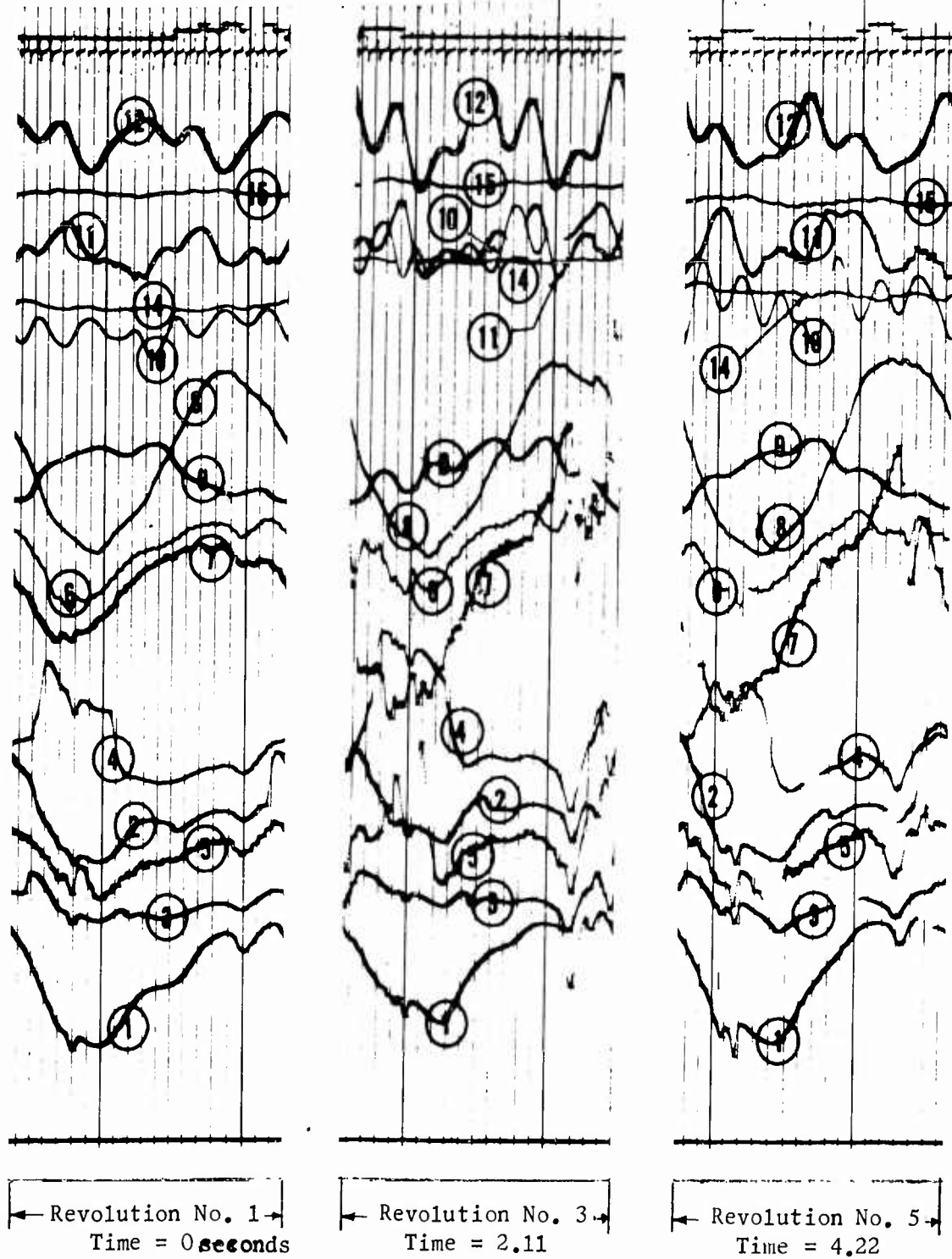


FIGURE 38e - THREE ROTOR REVOLUTIONS OSCILLOGRAPH NO. 5  
CONDITION NO. 34, SYMMETRICAL PULL-UP.

NO. - Channel Identification  
See Table 1

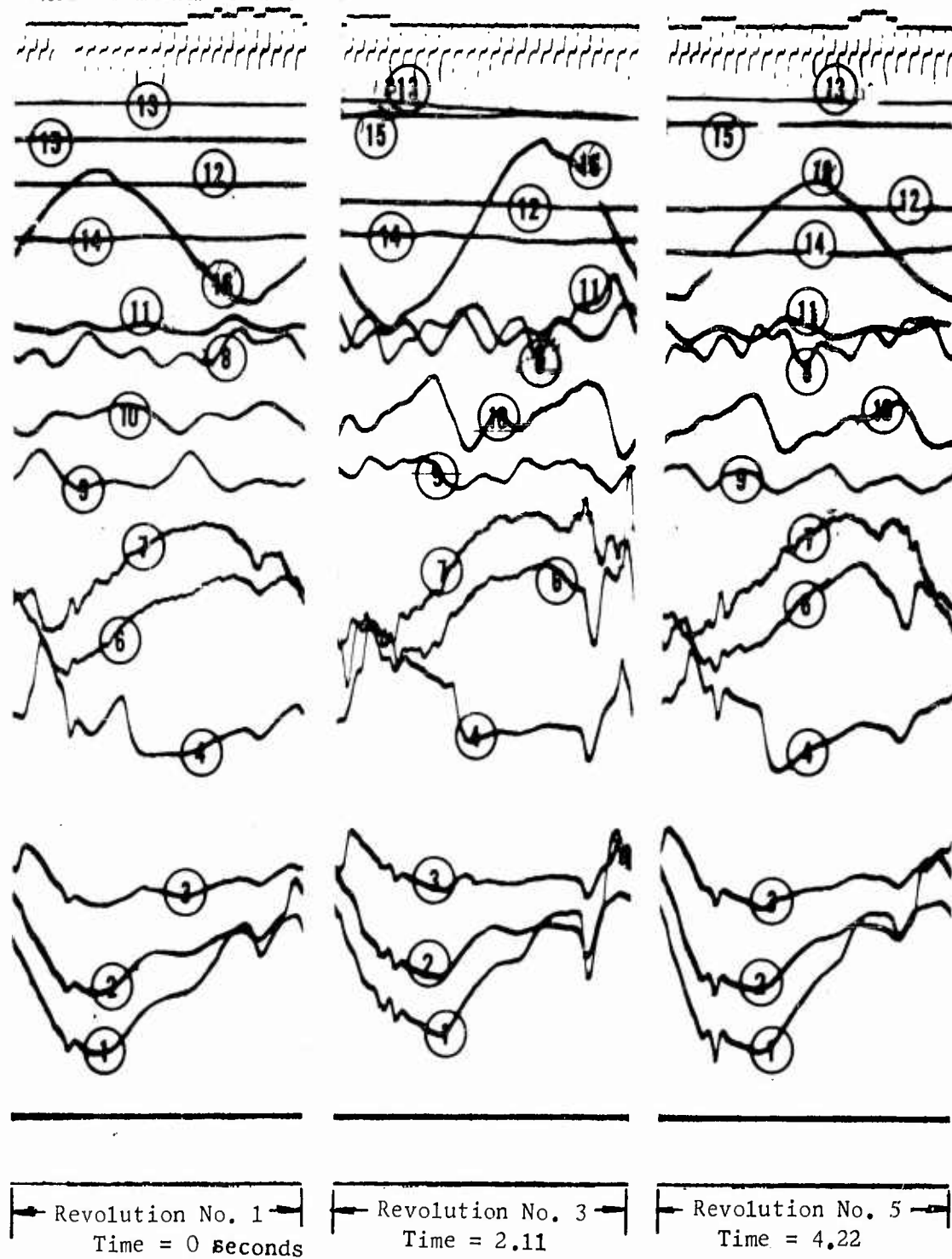


FIGURE 38f - THREE ROTOR REVOLUTIONS OSCILLOGRAPH NO. 6  
CONDITION NO. 34, SYMMETRICAL PULL-UP.

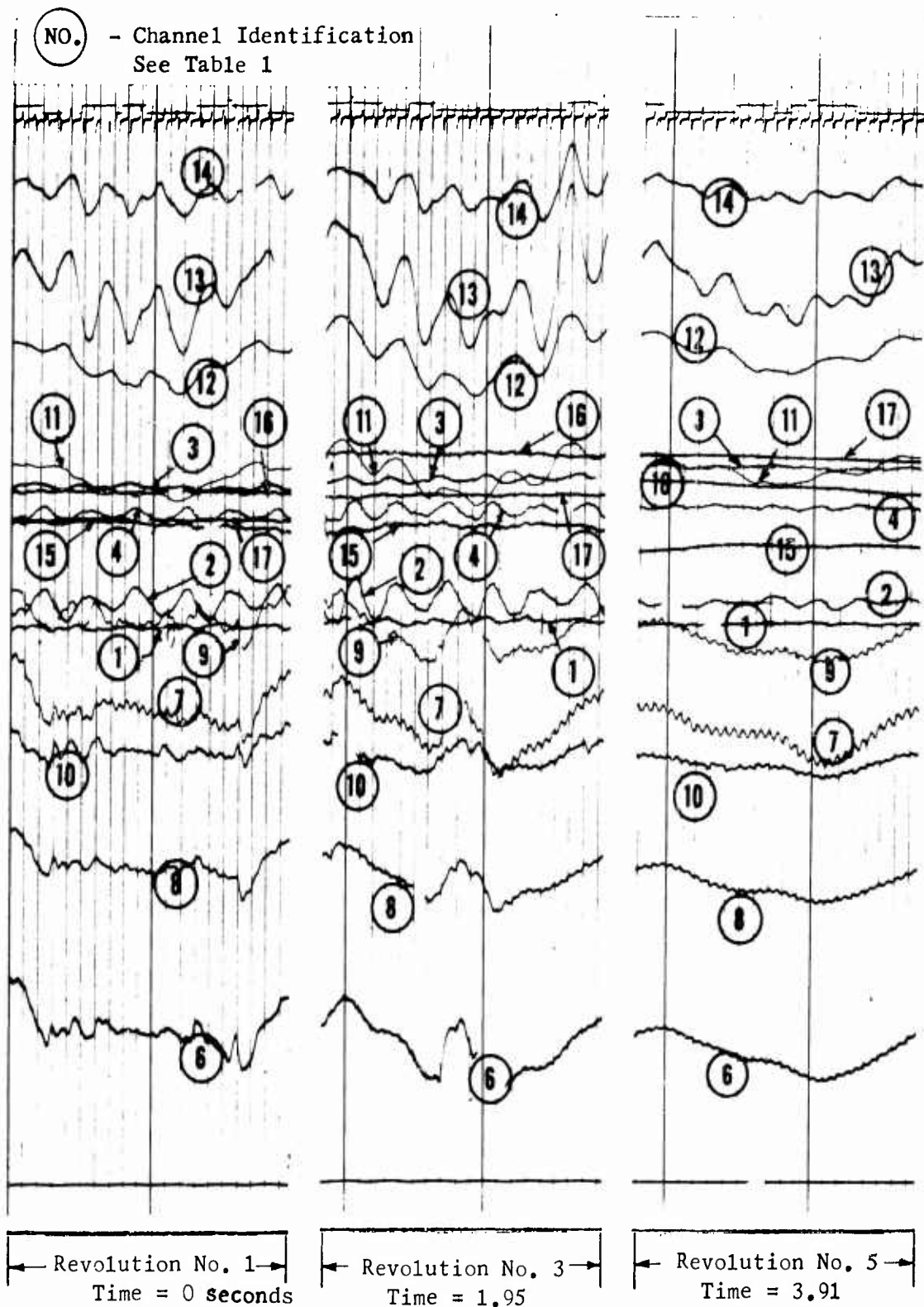


FIGURE 39a - THREE ROTOR REVOLUTIONS OSCILLOGRAPH NO. 1  
CONDITION NO. 38, APPROACH AND FLARE.

NO. - Channel Identification  
See Table 1

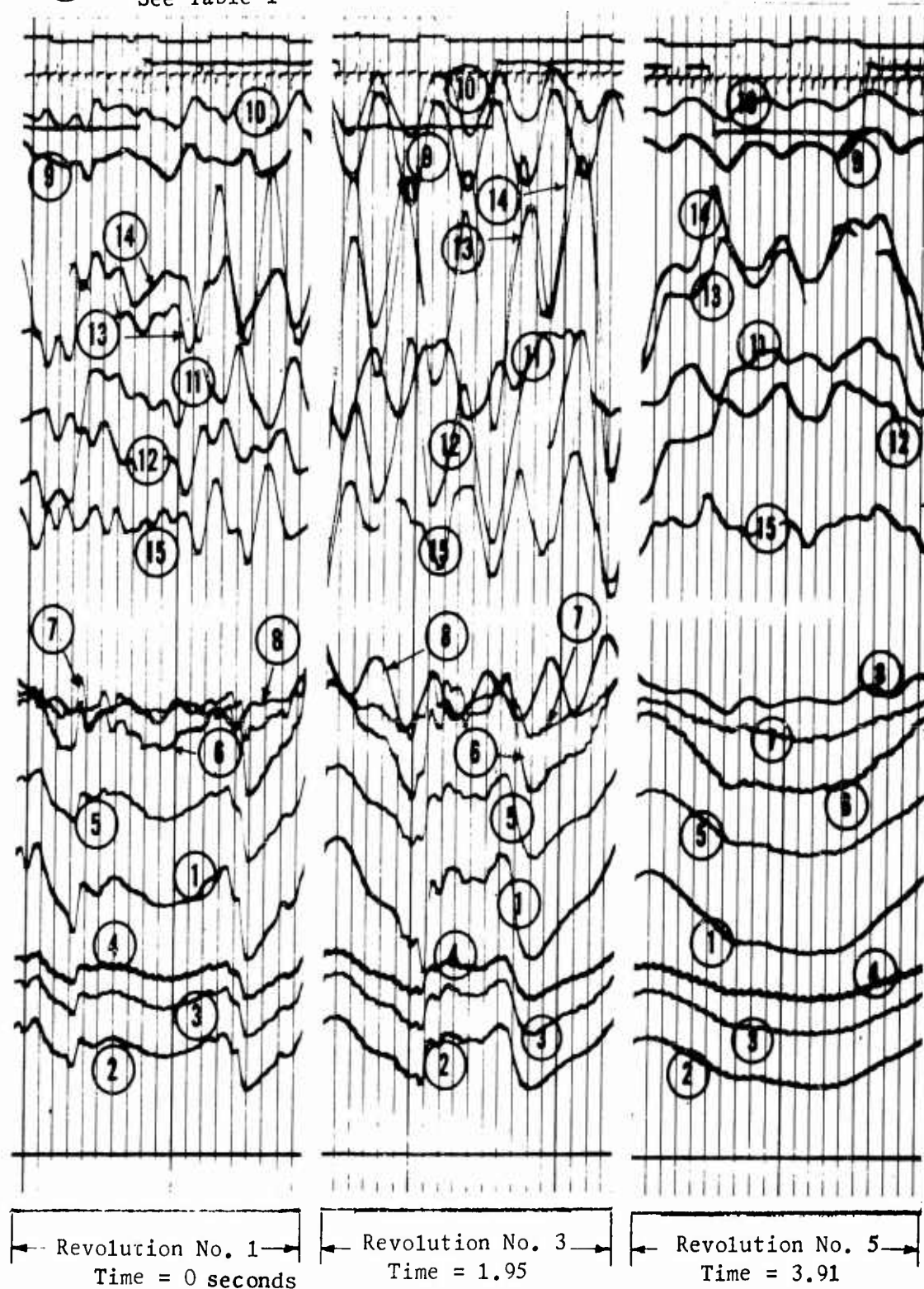


FIGURE 39b - THREE ROTOR REVOLUTIONS OSCILLOGRAPH NO. 2  
CONDITION NO. 38, APPROACH AND FLARE.



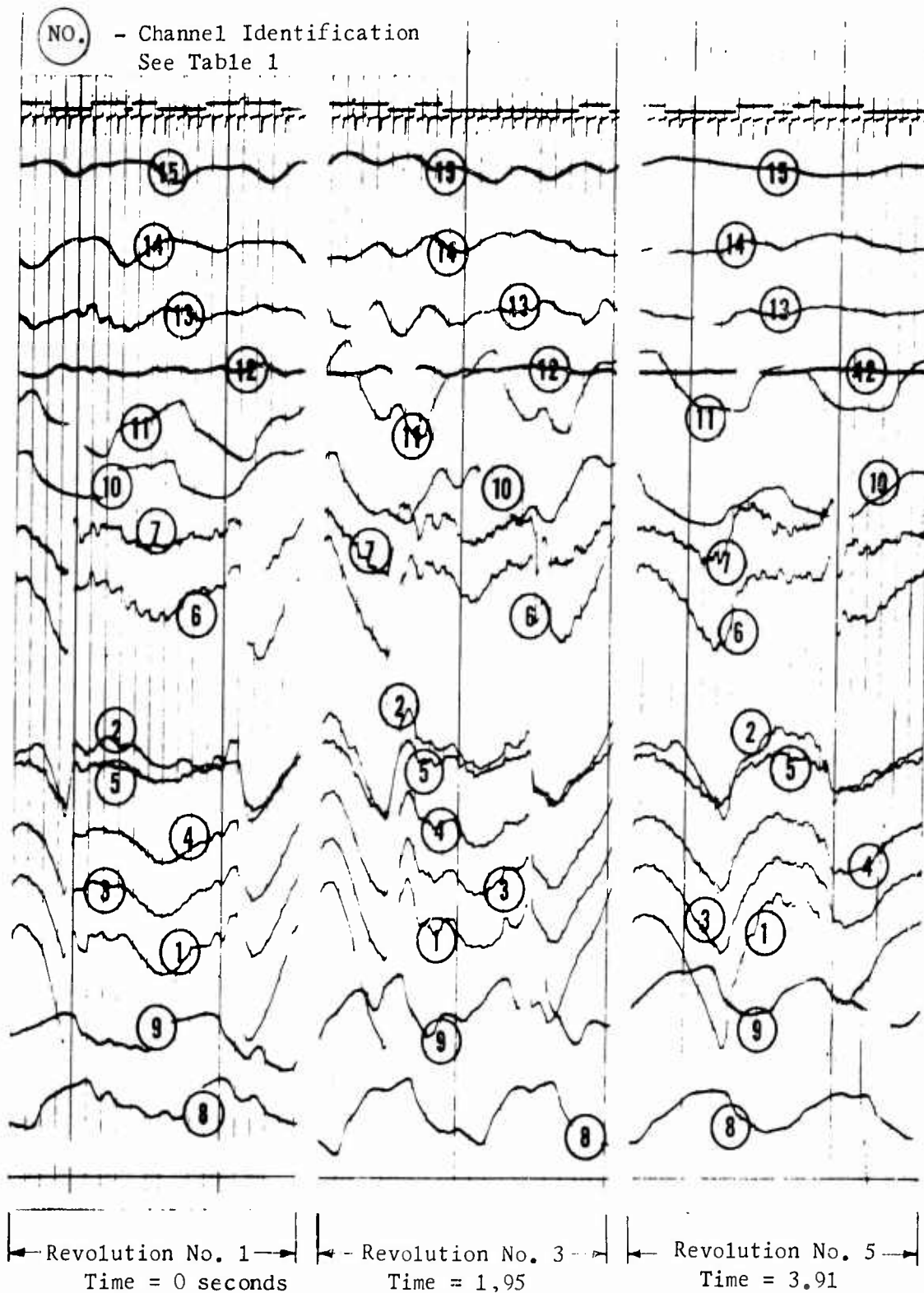
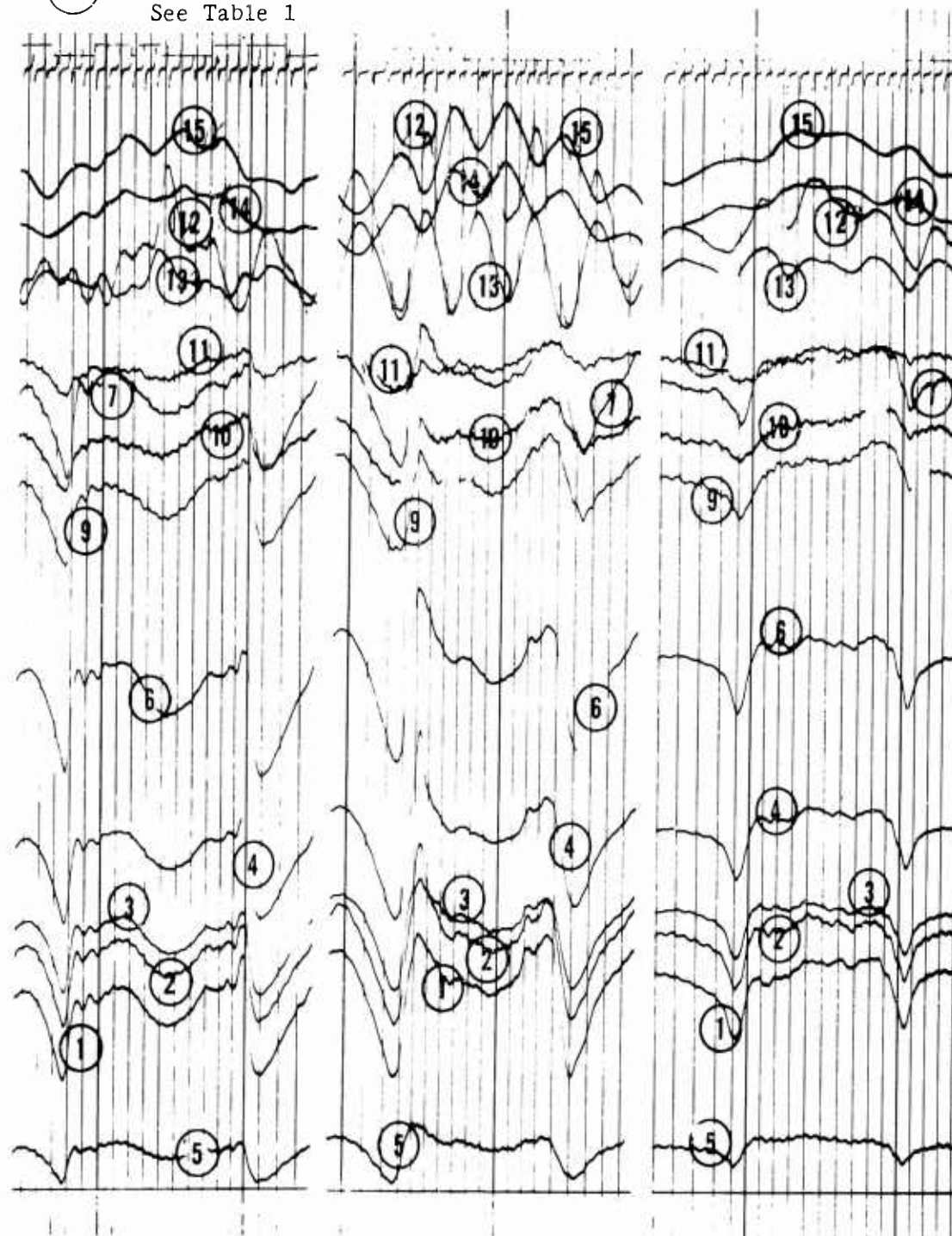


FIGURE 39c - THREE ROTOR REVOLUTIONS OSCILLOGRAPH NO. 3  
CONDITION NO. 38, APPROACH AND FLARE.

NO. - Channel Identification  
See Table 1



Revolution No. 1 Time = 0 seconds	Revolution No. 3 Time = 1.95	Revolution No. 5 Time = 3.91
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FIGURE 39d - THREE ROTOR REVOLUTIONS OSCILLOGRAPH NO. 4  
CONDITION NO. 38, APPROACH AND FLARE.



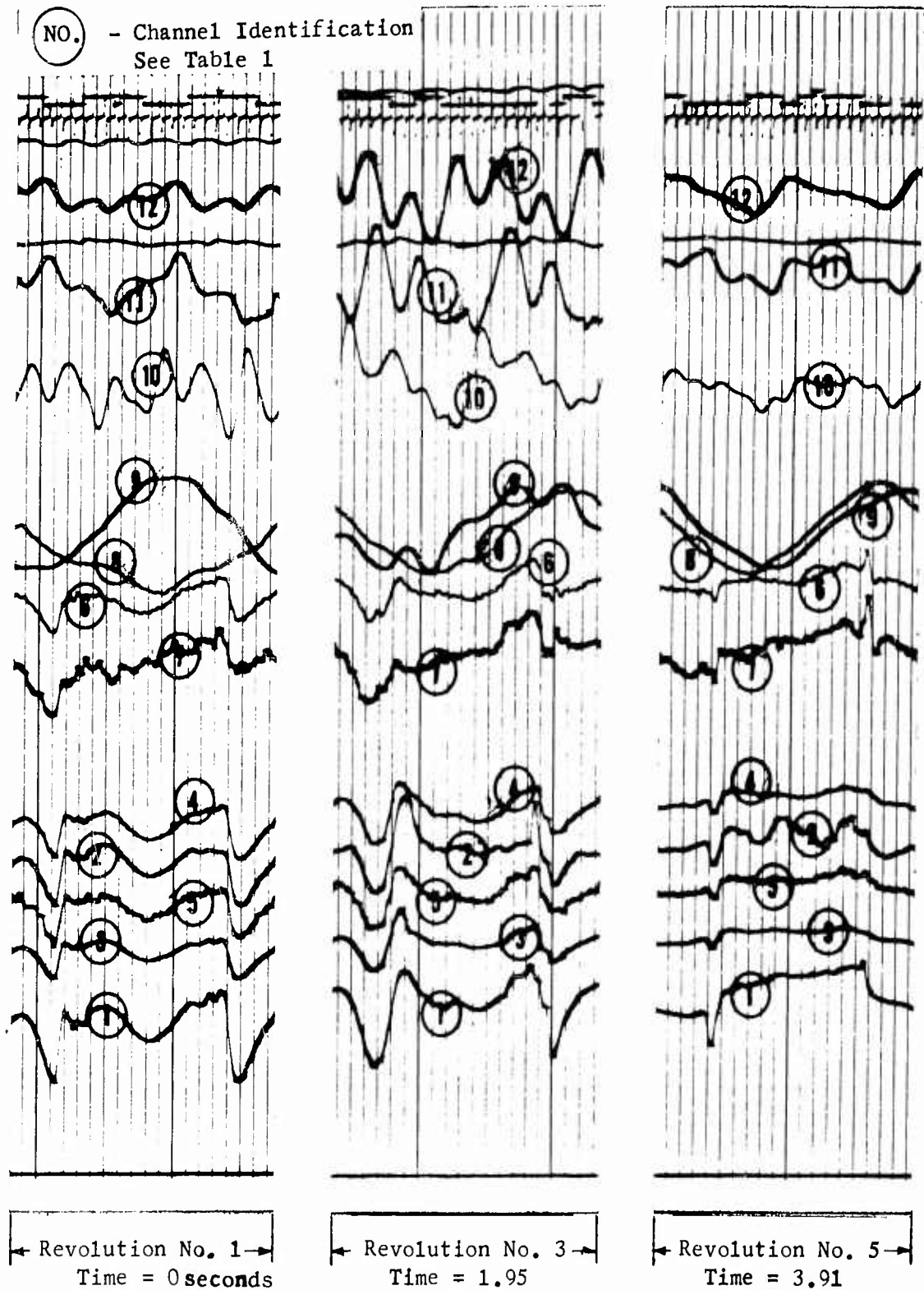


FIGURE 39e - THREE ROTOR REVOLUTIONS OSCILLOGRAPH NO. 5  
CONDITION NO. 38, APPROACH AND FLARE.

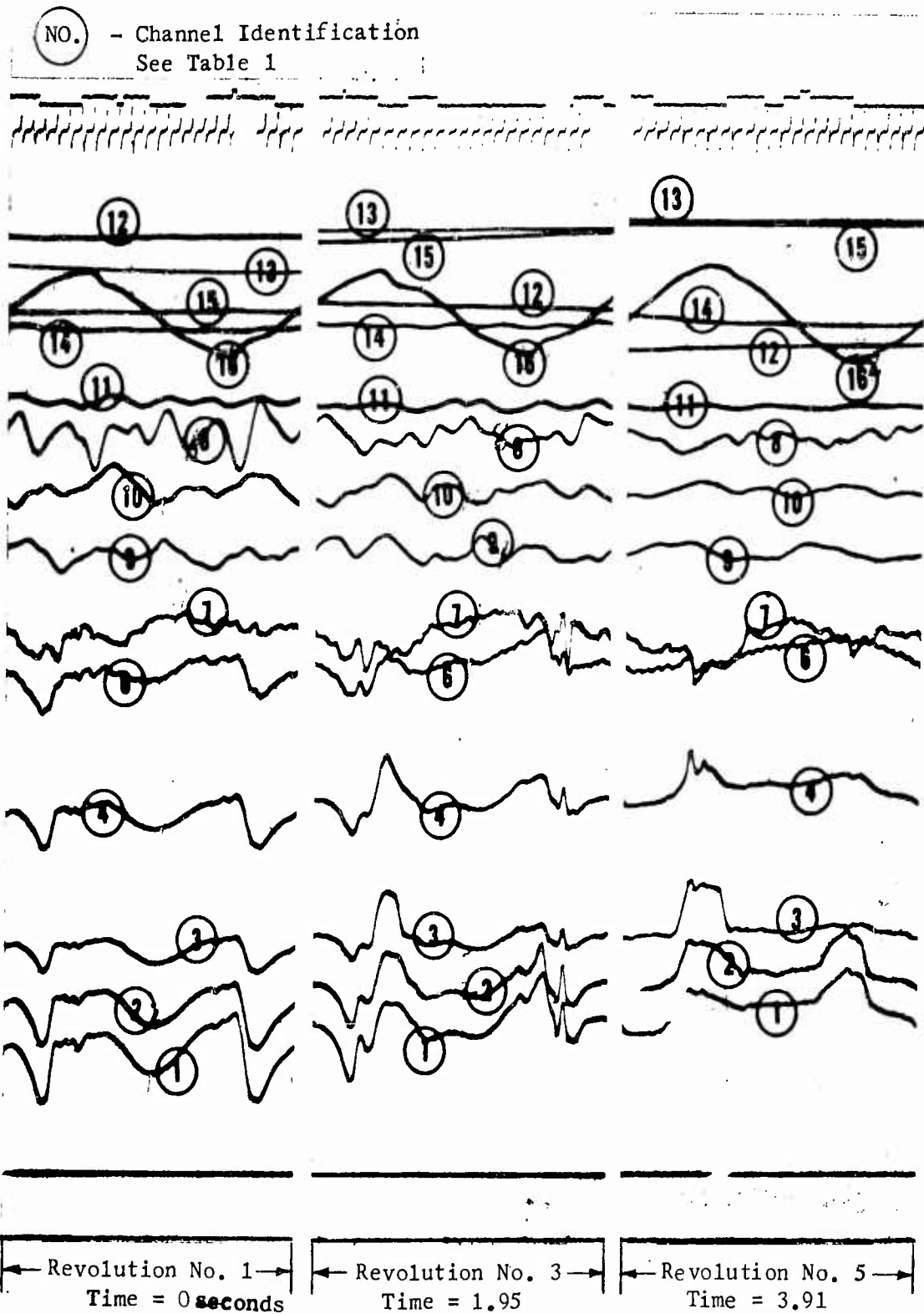


FIGURE 39f - THREE ROTOR REVOLUTIONS OSCILLOGRAPH NO. 6  
CONDITION NO. 38, APPROACH AND FLARE.

NO. - Channel Identification  
See Table 1

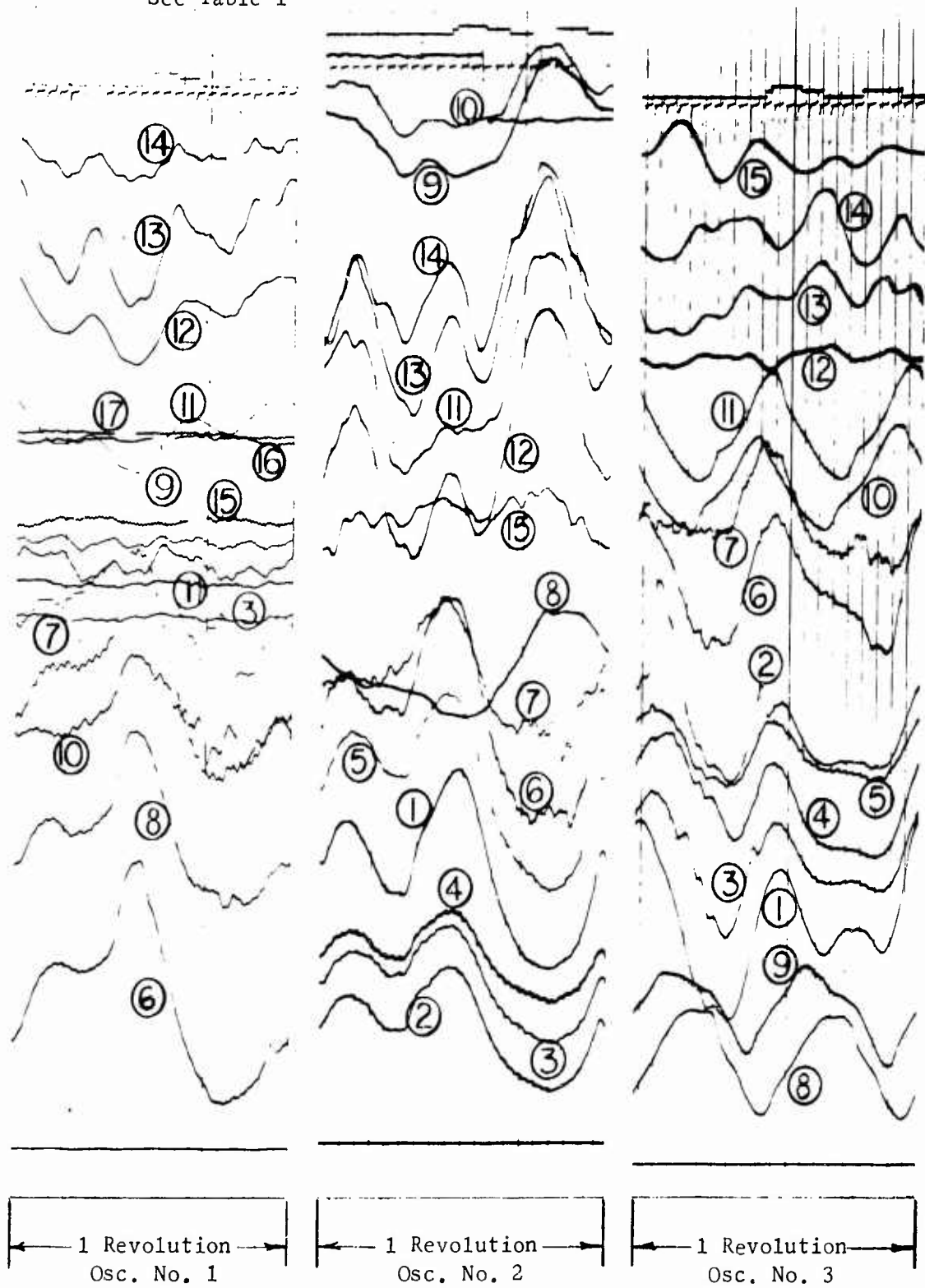


FIGURE 40a - OSCILLOGRAPH RECORDS TYPE I CONDITION NO. 31  
LEVEL FLIGHT.

NO. - Channel Identification  
See Table 1

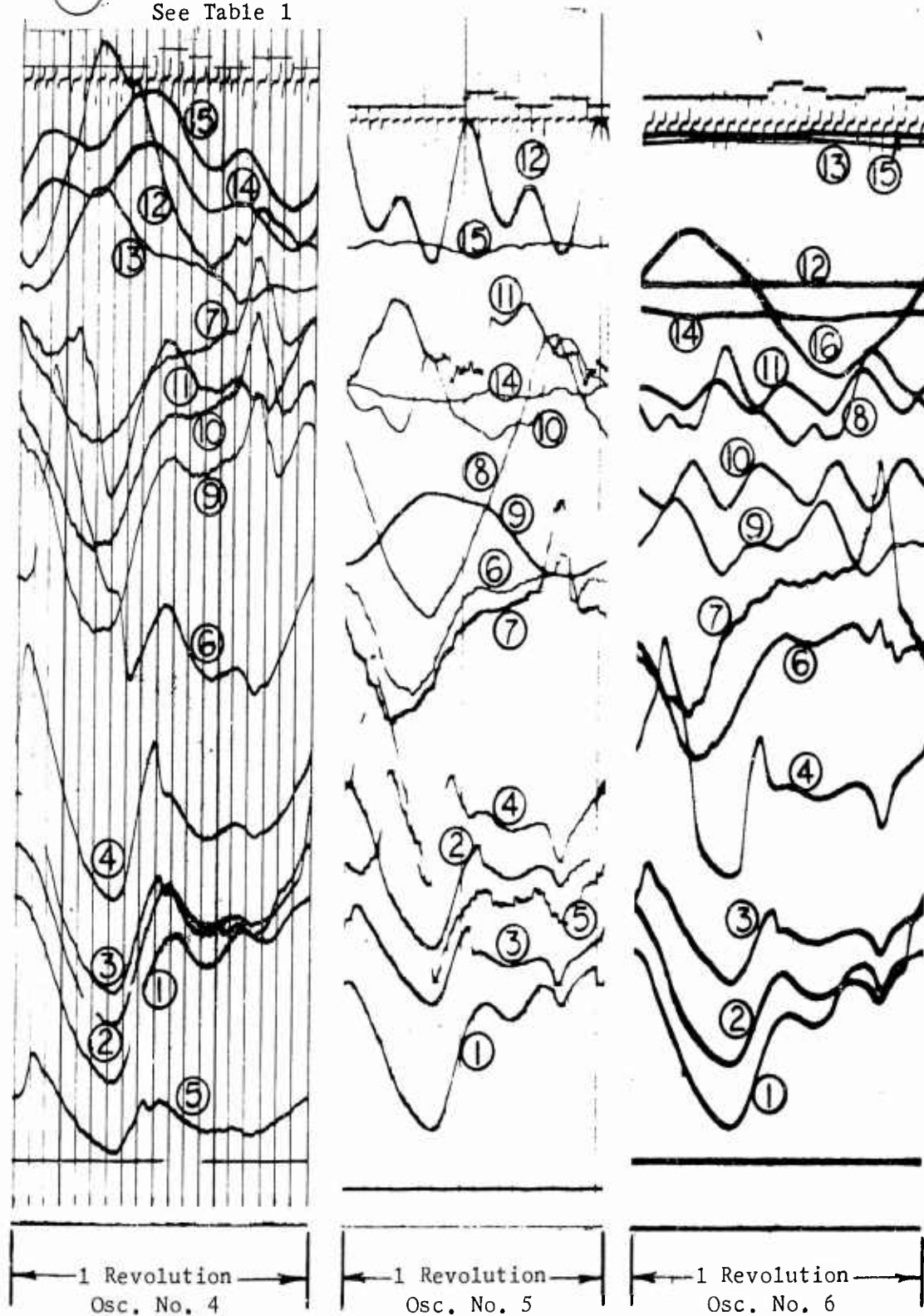


FIGURE 40b - OSCILLOGRAPH RECORDS TYPE I CONDITION NO. 31

LEVEL FLIGHT.

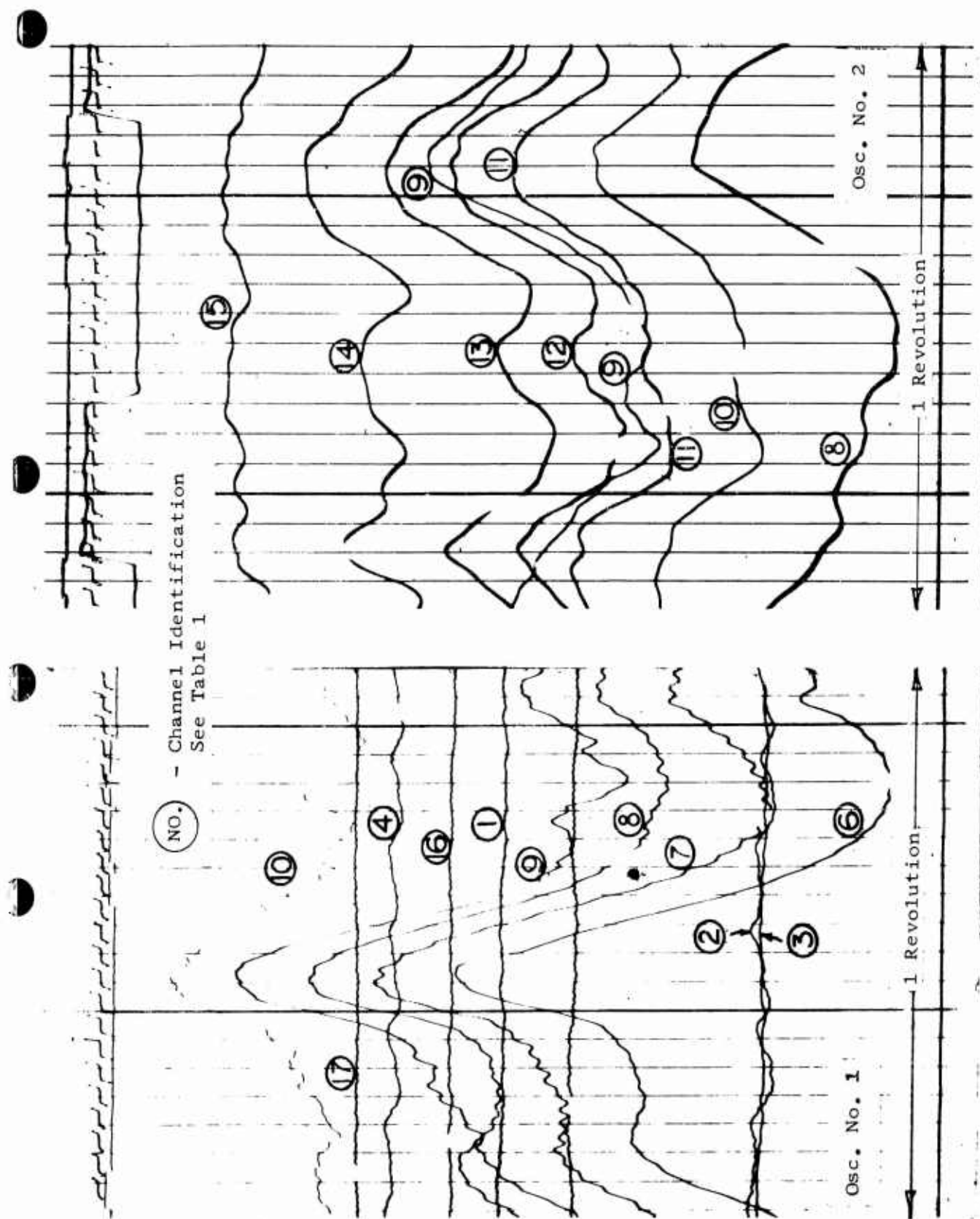


FIGURE 41a - OSCILLOGRAPH RECORDS TYPE II CONDITION NO. 67  
LEVEL FLIGHT.

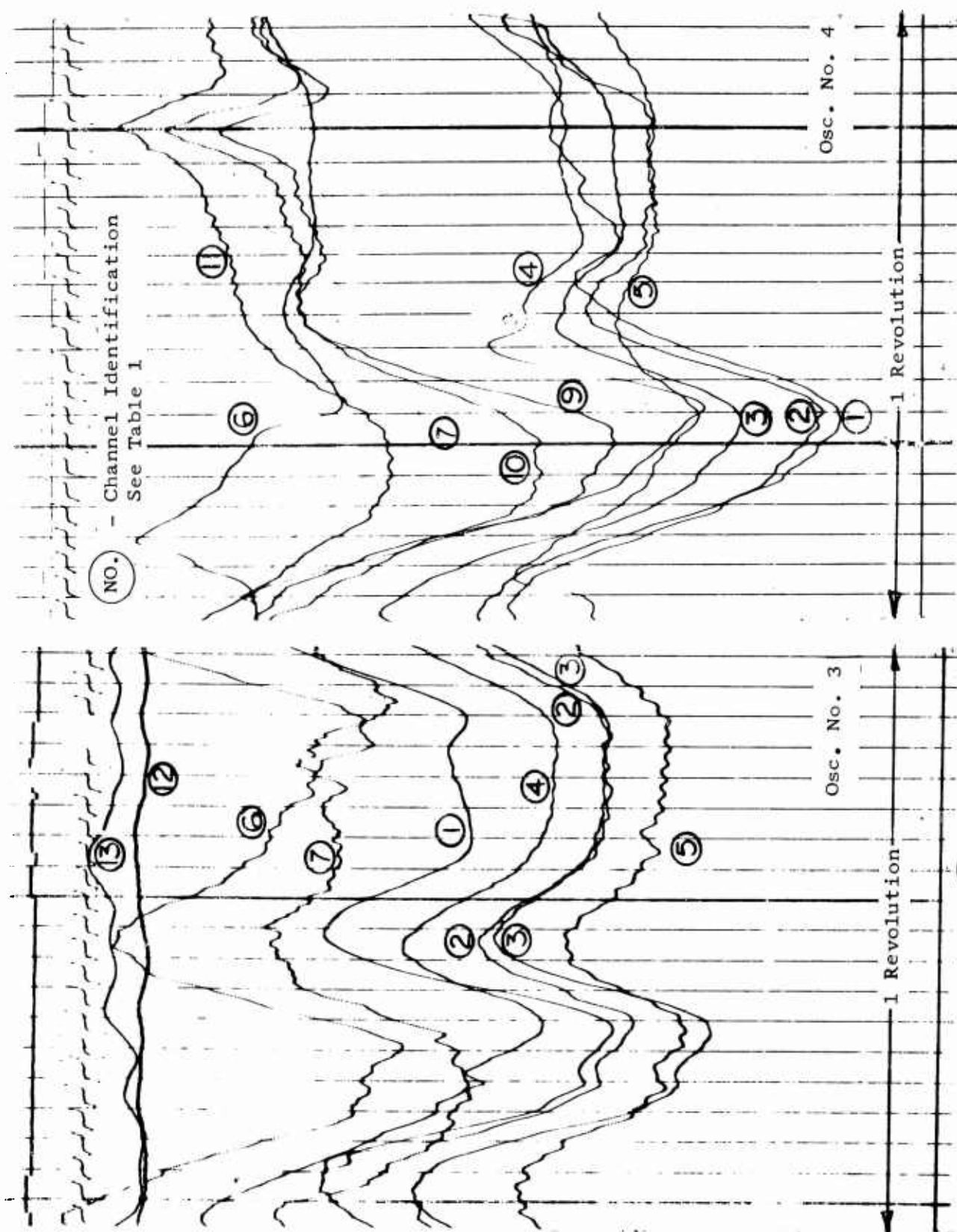


FIGURE 41b - OSCILLOGRAPH RECORDS TYPE II CONDITION NO. 67

LEVEL FLIGHT,



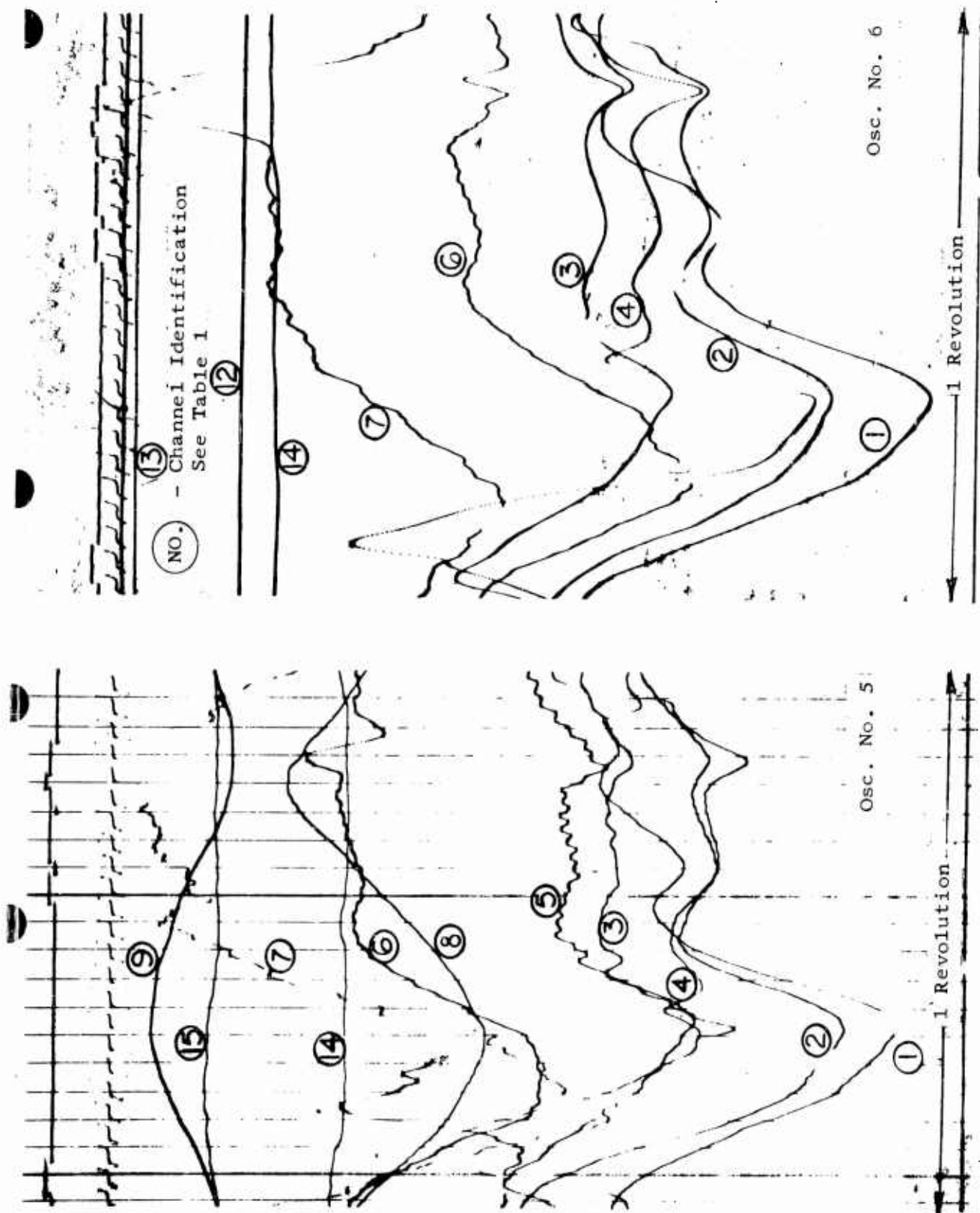


FIGURE 41c - OSCILLOGRAPH RECORDS TYPE II CONDITION NO. 67  
LEVEL FLIGHT.

TABLES



TABLE 1  
OSCILLOGRAPH SETUP

Red Blade = Instrumented Blade  
\*Data not recorded for Type II Conditions

Osc. Channel	Oscillograph 1	Oscillograph 2	Oscillograph 3	Oscillograph 4	Oscillograph 5	Oscillograph 6
1	Att. Gyro Roll	* $\Delta$ P 55%R 2% Ch	$\Delta$ P 75%R 2% Ch	$\Delta$ P 85%R 2% Ch	$\Delta$ P 90%R 2% Ch	$\Delta$ P 95%R 2% Ch
2		* $\Delta$ P 55%R 9% Ch	$\Delta$ P 75%R 9% Ch	$\Delta$ P 85%R 4% Ch	$\Delta$ P 90%R 9% Ch	$\Delta$ P 95%R 9% Ch
3	Att. Gyro Pitch	* $\Delta$ P 55%R 17% Ch	$\Delta$ P 75%R 17% Ch	$\Delta$ P 85%R 9% Ch	$\Delta$ P 90%R 17% Ch	$\Delta$ P 95%R 17% Ch
4		* $\Delta$ P 55%R 23% Ch	$\Delta$ P 75%R 23% Ch	$\Delta$ P 85%R 13% Ch	$\Delta$ P 90%R 23% Ch	$\Delta$ P 95%R 23% Ch
5		* $\Delta$ P 55%R 34% Ch	$\Delta$ P 75%R 34% Ch	$\Delta$ P 85%R 17% Ch	$\Delta$ P 90%R 34% Ch	$\Delta$ P 95%R 34% Ch Inoperative
6	$\Delta$ P 40%R 4% Ch	* $\Delta$ P 55%R 63% Ch	$\Delta$ P 75%R 63% Ch	$\Delta$ P 85%R 23% Ch	$\Delta$ P 90%R 63% Ch	$\Delta$ P 95%R 63% Ch
7	$\Delta$ P 40%R 17% Ch	* $\Delta$ P 55%R 90% Ch	$\Delta$ P 75%R 90% Ch	$\Delta$ P 85%R 34% Ch	$\Delta$ P 90%R 90% Ch	$\Delta$ P 95%R 90% Ch
8	$\Delta$ P 40%R 34% Ch	Red Blade Bm Bend. 15%R	*R.F. Pylon Pos	$\Delta$ P 85%R 47.7% Ch Inoperative	Red Bl Pitch Pos	*Lift Link Load
9	$\Delta$ P 40%R 63% Ch	Red Blade Bm Bend. 28%R	*R.A. Pylon Pos	$\Delta$ P 85%R 53% Ch	Red Bl Flap Pos	*Rt Cyclic Tube
10	$\Delta$ P 40%R 88% Ch	Red Blade Bm Bend. 36%R	*L.F. Pylon Pos	$\Delta$ P 85%R 77% Ch	*Vert Accel	*L Cyclic Tube
11	*Red Blade Ch Bend. 15%R	Red Blade Bm Bend. 45%R	*L.A. Pylon Pos	$\Delta$ P 85%R 90% Ch	*F & A Accel	*Coll Tube
12	*Red Blade Ch Bend. 28%R	Red Blade Bm Bend. 60%R	Red Blade Torsion 15%R	*Wh Blade Bm Bend. 15%R	*Lat Accel	Rud Pedal Pos
13	*Red Blade Ch Bend. 60%R	Red Blade Bm Bend. 65%R	Red Blade Torsion 50%R	*Wh Blade Bm Bend. 28%R		F & A Cyclic Pos
14	*Red Blade Ch Bend. 80%R	Red Blade Bm Bend. 80%R	*Red Pitch Link	*Wh Blade Ch Bend. 15%R	Angle of Attack	Lat. Cyclic Pos
15	Roll Rate	Red Blade Bm Bend. 92.5%R	*Wh Pitch Link	*Wh Blade Ch Bend. 28%R	Yaw	Coll Stick Pos
16	Pitch Rate					Stab. Bar Pos
17	Yaw Rate					
18	AZ	AZ	AZ	AZ	AZ	AZ

TABLE 2  
FLIGHT LOG

Flight No.	Ground Run No.	Date	Time (hr)	Purpose
	3B	7-18-61	.3	Rotor Track and Balance
	4B	7-20-61	.1	Rotor Track and Balance
	5B	7-26-61	1.2	Rotor Track and Balance
3A,B,C,D		7-26-61	.6	Shake Down Flight
	6B,C	7-27-61	.2	Transducer Check
4A		8-4-61	.3	Airspeed Calibration
5A,B,C		8-7-61	.7	Airspeed Calibration
6A,B		8-8-61	.3	Transducer Check (Taped)
7A		8-11-61	.5	Dynamic Pressure Survey
8A		8-23-61	.2	Instrumentation Check
9A		8-24-61	.2	Instrumentation Check
10A,B,C		8-25-61	1.2	Dynamic Pressure Survey
11A		9-6-61	.2	Instrumentation Check
12A		9-7-61	.4	Dynamic Pressure Survey

TABLE 3  
LIST OF FLIGHT CONDITIONS RECORDED

Flight No. 7A, August 11, 1961  
I. Hartwig, Pilot; C. Coulter, Observer

Weather Cond.:	Wind SSW, 4-6 Kn	Take-off Gross Weight = 6175 lb.
Barometer:	Hp = 490 Ft	Take-off Fuel = 300 lb.
Gnd Temp.:	+ 24°C	Center of Gravity at Sta. 132

CONDITION NO.	CNTR NO.	MANEUVER OR STEADY	FLIGHT CONDITION	IAS (Kn)	Hp (Ft) ( )*	FUEL CNTR (Gallons)	ROTOR r.p.m. (Nom)	REMARKS
00	400	S	Ground Run	0			200 311	
01	401	S	Hover IGE	0	(4)	3	314	
02	402	M	Accelerate	0-50	(50)	5	314	
03	403	S	Maximum Climb	60	1300	6	314	
04	404	S	Level Flight	100	2000	10	324	
05	405	S	Level Flight	100	2050	11	314	
06	406	S	Level Flight	82	2200	11	314	
07	407	S	Level Flight	81	2200	14	324	
08	408	S	Level Flight	62	2250	15	314	
09	409	S	Level Flight	39	2280	16	314	
10	410	S	Level Flight	30	2280	17	314	
11	411	S	Level Flight	22	2290	18	314	
12	412	S	Hover OGE	0	2250	18	314	
13	413	M	90° Right Turn	80	2300	21	314	Hold Turn Radius IAS & Hp Max. Bank Angle of 37°
14	414	M	90° Left Turn	80	2320	23	314	Hold Turn Radius IAS & Hp Max. Bank Angle of 37°
15	415	M	Symm Pull-Up 1.3 g	80	2400	24	314	Cyclic & Coll. Approx. 1.3 g's
16	416	M	Rolling Pull-Out	80	2400	25	314	
17	417	S	Level Flight	81	2340	26	314	
18	418	S	Partial Pwr Descent	22	2000 1000	27	314	6 p.s.i. Torque
19	419	S	Autorotation	52	1000 100	28	314	
20	420	M	Approach and Flare	50-0	(100-0)	30	314	

\* Absolute Altitude

TABLE 3 (cont'd)  
LIST OF FLIGHT CONDITIONS RECORDED

Flight No. 10A, August 25, 1961  
L. Hartwig, Pilot; C. Coulter, Observer

Weather Cond.: CAVU  
Barometer: 30.03 In. Hg,  $H_p=500$  Ft  
Gnd Temp.: + 28°C

Take-off Gross Weight = 6151 lb.  
Take-off Fuel = 300 lb.  
Center of Gravity at Sta. 132.4

CONDITION NO.	CNTR NO.	MANEUVER OR STEADY	FLIGHT CONDITION	IAS (Kn)	$H_p$ (Ft) ( )**	FUEL CNTR (Gallons)	ROTOR r.p.m. (Nom)	REMARKS
21	559	M	Acceleration	0-50	(50)	9	314	
22	560	S	Maximum Pwr Climb	50	1200	10	314	
23*	561	S	Maximum Pwr Climb	22	1800	10	314	
24	562	S	Level Flight	80	1700	11	324	
25	563	S	Level Flight	100	1800	14	324	
26	564	S	Level Flight	110	1820	14	324	$V_{max}$ as limited by rotor roughness
27*	565	S	Level Flight	30	1900	15	314	
28	566	S	Level Flight	60	2000	16	314	
29*	567	S	Level Flight	80	2020	17	314	
30	568	S	Level Flight	100	2100	18	314	
31*	569	S	Level Flight	105	2125	19	314	$V_{max}$ as limited by rotor roughness
32	570	M	Right Turn	80	2150	20	314	
33	571	M	Left Turn	80	2170	21	314	
34*	572	M	Symm Pull-Up	80	2240	22	314	Cyclic and Coll. 80 Kn Entry
35	573	M	Rolling Pull-Out	80	2230	23	314	
36	574	S	Autorotation	87	1500	24	314	
37	575	S	Autorotation	50	1600	25	314	
38*	576	M	Approach and Flare	50-0	(0)	26	314	

\* These flight data reduced and presented in this report.

\*\*Absolute Altitude

TABLE 3 (cont'd)  
LIST OF FLIGHT CONDITIONS RECORDED

Flight No. 10B, August 25, 1961  
L. Hartwig, Pilot; C. Coulter, Observer

Weather Cond.: CAVU  
Barometer: 30.03 In. Hg, H<sub>p</sub>=500 Ft.  
Gnd Temp.: + 28°C

Take-off Gross Weight = 6151 lb.  
Take-off Fuel = 300 lb.  
Center of Gravity at Sta. 132.4

CONDITION NO.	CNTR NO.	MANEUVER OR STEADY	FLIGHT CONDITION	IAS (Kn)	H <sub>p</sub> (Ft)	FUEL CNTR (Gallons)	ROTOR r.p.m. (Nom)	REMARKS
39	578	S	Hover Z/D .33	0	(5.6)	1	314	
40	579	S	Hover Z/D .66	0	(20)	2	314	
41	580	S	Hover Z/D 1.0	0	(35)	3	314	
42*	581	S	Hover Z/D 1.5	0	(57)	4	314	
43	582	M	Fwd, Spot - Spot	10	(8)	5	314	
44	583	S	Reverse Flight	10	(8)	6	314	
45	584	M	Left, Spot - Spot	10	(8)	9	314	
46	585	M	Normal Deceleration	50-0	1000	12	314	Hold Alt
47	586	M	Fast Deceleration	50-0	1000	13	314	
48	587	M	Up Collective	60	1300	14	314	Step 16-21 p.s.i.
49	588	M	Greater Up Coll	60	1300	15	314	16-26 p.s.i.
50	589	M	Down Collective	60	1700	16	314	Step 20-15 p.s.i.
51	590	M	Greater Down Coll	60	1400	17	314	20-2 p.s.i.
52	591	M	Approach and Flare	50-0	(50)	19	314	

\* These flight data reduced and presented in this report.

\*\*Absolute Altitude

TABLE 3 (cont'd)  
LIST OF FLIGHT CONDITIONS RECORDED

Flight No. 10C, August 25, 1961  
L. Hartwig, Pilot; C. Coulter, Observer

Weather Cond.: CAVU  
Barometer: 30.03 In. Hg  
Gnd Temp.: + 28°C

Take-off Gross Weight = 6385 lb.  
Take-off Fuel = 450 lb.  
Center of Gravity at Sta. 132.2

CONDITION NO.	CNTR NO.	MANEUVER OR STEADY	FLIGHT CONDITION	IAS (Kn)	H <sub>p</sub> (Ft) ( )**	FUEL CNTR (Gallons)	ROTOR r.p.m. (Nom)	REMARKS
53	601	S	Maximum Pwr Ascent	0	700	4	314	
54	602	S	Partial Pwr Climb	55	1200	5	314	
55*	603	S	Stall Threshold	75	9400	17	324	
56	604	M	Alt Left Turn	75	9300	18	320	
57	605	M	Alt Right Turn	75	9300	18	320	
58*	606	S	Stall Threshold	60	9300	19	324	
59	607	S	Partial Pwr Descent	65	8700	20	314	12 p.s.i.
60	608	S	Partial Pwr Descent	0	6050	21	314	14 p.s.i.
61	609	S	Partial Pwr Descent	80	4600	22	314	10 p.s.i.
62	610	S	Autorotation	20	3800	22	314	
63	611	S	Autorotation	0	1800	23	314	
64	612	M	Approach and Flare	50-0	(50)	27	314	

\* These flight data reduced and presented in this report.

\*\*Absolute Altitude

TABLE 3 (cont'd)  
LIST OF FLIGHT CONDITIONS RECORDED

Flight No. 12A (Type II), September 7, 1961  
L. Hartwig, Pilot; C. Coulter, Observer

Weather Cond.:	CAVU	Take-off Gross Weight =	6151 lb.
Barometer:	29.98 In. Hg	Take-off Fuel	= 300 lb.
Gnd Temp.:	+ 30°C	Center of gravity at Sta.	132.4

CONDITION NO.	CNTR NO. OR MANEUVER STEADY	FLIGHT CONDITION	IAS (Kn)	H <sub>p</sub> (Ft)	FUEL CNTR (Gallons)	ROTOR r.p.m. (Nom)	REMARKS
65*	694	S	Level Flight	30	1400	11	314
66*	696	S	Level Flight	80	1400	17	314
67*	697	S	Level Flight	105	1400	18	314
68*	698	S	Level Flight	105	1400	19	324

\* These flight data reduced and presented in this report.

TABLE 4a  
TRACE SENSITIVITIES FOR  
DYNAMIC AIR LOADS MEASUREMENT PROGRAM  
TYPE I FLIGHT NO. 10, OSCILLOGRAPH NO. 1  
CONDITION NOS. 23, 27, 29, 31, 34, 38, 42, 55, 58

No.	Oscillograph Channel	Trace Zero (Inches)	Calibration Constant	Droop
1	Att Gyro Roll	3.36	18.29 deg/in.	
2				
3	Att Gyro Pitch	3.38	15.4 deg/in.	
4				
5				
6	$\Delta P$ 40%R, 4% Ch	.19	3.51 p.s.i./in.	
7	$\Delta P$ 40%R, 17% Ch	.21	1.82 p.s.i./in.	
8	$\Delta P$ 40%R, 34% Ch	1.33	1.2 p.s.i./in.	
9	$\Delta P$ 40%R, 63% Ch	2.63	.44 p.s.i./in.	
10	$\Delta P$ 40%R, 88% Ch	2.13	.31 p.s.i./in.	
11	Red Blade Ch, 15%R	3.91	269,500 in.-lb/in.	
12	Red Blade Ch, 28%R	4.49	176,650 in.-lb/in.	
13	Red Blade Ch, 60%R	4.66	46,055 in.-lb/in.	
14	Red Blade Ch, 80%R	5.38	47,035 in.-lb/in.	
15	Roll Rate	3.69	13.4 deg/sec	
16	Pitch Rate	4.09	13.8 deg/sec	
17	Yaw Rate	4.16	13.4 deg/sec	
18	AZ			



TABLE 4b  
TRACE SENSITIVITIES FOR  
DYNAMIC AIR LOADS MEASUREMENT PROGRAM  
TYPE I FLIGHT NO. 10, OSCILLOGRAPH NO. 2  
CONDITION NOS. 23, 27, 29, 31, 34, 38, 42, 55, 58

No.	Oscillograph Channel	Trace Zero (Inches)	Calibration Constant	Droop
1	$\Delta P$ 55%R, 2% Ch	.58	4.61 p.s.i./in.	
2	$\Delta P$ 55%R, 9% Ch	.07	4.55 p.s.i./in.	
3	$\Delta P$ 55%R, 17% Ch	.35	3.51 p.s.i./in.	
4	$\Delta P$ 55%R, 23% Ch	.65	3.56 p.s.i./in.	
5	$\Delta P$ 55%R, 34% Ch	.92	1.32 p.s.i./in.	
6	$\Delta P$ 55%R, 63% Ch	1.34	.41 p.s.i./in.	
7	$\Delta P$ 55%R, 90% Ch	1.90	.27 p.s.i./in.	
8	Red Blade Bm, 15%R	2.49	60,830 in.-lb/in.	-17,650 in.-lb
9	Red Blade Bm, 28%R	5.10	17,665 in.-lb/in.	-13,050 in.-lb
10	Red Blade Bm, 36%R	5.54	19,650 in.-lb/in.	-10,600 in.-lb
11	Red Blade Bm, 45%R	3.53	8,280 in.-lb/in.	- 8,100 in.-lb
12	Red Blade Bm, 60%R	3.77	7,496 in.-lb/in.	- 4,900 in.-lb
13	Red Blade Bm, 65%R	4.80	7,777 in.-lb/in.	- 4,000 in.-lb
14	Red Blade Bm, 80%R	5.32	7,715 in.-lb/in.	- 1,900 in.-lb
15	Red Blade Bm, 92.5%R	3.78	9,500 in.-lb/in.	- 600 in.-lb
16				
17				
18	AZ			

TABLE 4c  
TRACE SENSITIVITIES FOR  
DYNAMIC AIR LOADS MEASUREMENT PROGRAM  
TYPE I FLIGHT NO. 10, OSCILLOGRAPH NO. 3  
CONDITION NOS. 23, 27, 29, 31, 34, 38, 42, 55, 58

No.	Oscillograph Channel	Trace Zero (Inches)	Calibration Constant	Droop
1	$\Delta P$ 75%R, 2% Ch	.03	4.72 p.s.i./in.	
2	$\Delta P$ 75%R, 9% Ch	1.53	4.24 p.s.i./in.	
3	$\Delta P$ 75%R, 17% Ch	.86	2.84 p.s.i./in.	
4	$\Delta P$ 75%R, 23% Ch	1.05	2.59 p.s.i./in.	
5	$\Delta P$ 75%R, 34% Ch	1.86	2.84 p.s.i./in.	
6	$\Delta P$ 75%R, 63% Ch	2.32	.64 p.s.i./in.	
7	$\Delta P$ 75%R, 90% Ch	2.72	.36 p.s.i./in.	
8	Pylon Pos RF	.31	.30 in./in.	
9	Pylon Pos RA	.58	.30 in./in.	
10	Pylon Pos LF	4.02	.30 in./in.	
11	Pylon Pos LA	4.21	.30 in./in.	
12	Red B1 Torsion, 15%	4.75	61,780 in.-lb/in.	
13	Red B1 Torsion, 50%	5.19	7,600 in.-lb/in.	
14	Red Pitch Link	5.46	2,785 lb/in.	
15	White Pitch Link	5.91	2,916 lb/in.	
16				
17				
18	AZ			

TABLE 4d  
TRACE SENSITIVITIES FOR  
DYNAMIC AIR LOADS MEASUREMENT PROGRAM  
TYPE I FLIGHT NO. 10, OSCILLOGRAPH NO. 4  
CONDITION NOS. 23, 27, 29, 31, 34, 38, 42, 55, 58

No.	Oscillograph Channel	Trace Zero (Inches)	Calibration Constant	Droop
1	$\Delta P$ 85%R, 2% Ch	.22	8.30 p.s.i./in.	
2	$\Delta P$ 85%R, 4% Ch	.59	8.89 p.s.i./in.	
3	$\Delta P$ 85%R, 9% Ch	.75	6.85 p.s.i./in.	
4	$\Delta P$ 85%R, 13% Ch	1.19	4.63 p.s.i./in.	
5	$\Delta P$ 85%R, 17% Ch	- .08	9.80 p.s.i./in.	
6	$\Delta P$ 85%R, 23% Ch	1.64	2.19 p.s.i./in.	
7	$\Delta P$ 85%R, 34% Ch	3.49	1.84 p.s.i./in.	
8				
9	$\Delta P$ 85%R, 63% Ch	3.21	.95 p.s.i./in.	
10	$\Delta P$ 85%R, 77% Ch	3.94	.95 p.s.i./in.	
11	$\Delta P$ 85%R, 90% Ch	4.61	.94 p.s.i./in.	
12	White Blade Bm, 15%R	4.85	21,950 in.-lb/in.	-17,650 in.-lb
13	White Blade Bm, 28%R	4.31	16,646 in.-lb/in.	-13,050 in.-lb
14	White Blade Ch, 15%R	5.23	218,680 in.-lb/in.	
15	White Blade Ch, 28%R	5.40	143,970 in.-lb/in.	
16				
17				
18	AZ			

TABLE 4e  
TRACE SENSITIVITIES FOR  
DYNAMIC AIR LOADS MEASUREMENT PROGRAM  
TYPE I FLIGHT NO. 10, OSCILLOGRAPH NO. 5  
CONDITION NOS. 23, 27, 29, 31, 34, 38, 42, 55, 58

No.	Oscillograph Channel	Trace Zero (Inches)	Calibration Constant	Droop
1	$\Delta P$ 90%R, 2% Ch	.20	10.58 p.s.i./in.	
2	$\Delta P$ 90%R, 9% Ch	.35	9.22 p.s.i./in.	
3	$\Delta P$ 90%R, 17% Ch	.98	11.83 p.s.i./in.	
4	$\Delta P$ 90%R, 23% Ch	1.52	4.90 p.s.i./in.	
5	$\Delta P$ 90%R, 34% Ch	1.20	3.70 p.s.i./in.	
6	$\Delta P$ 90%R, 63% Ch	3.02	1.65 p.s.i./in.	
7	$\Delta P$ 90%R, 90% Ch	3.18	.89 p.s.i./in.	
8	Red Blade Pitch Pos	3.21	11.6 deg/in.	+ 9.5 deg
9	Red Blade Flap Pos	3.79	10.6 deg/in.	
10	Vert Accel	4.55	.6 g's/in.	+ 1.0 g
11	F & A Accel	5.18	.66 g's/in.	
12	Lat Accel	5.65	.68 g's/in.	
13				
14	Angle of Attack	4.80	27.0 deg/in.	
15	Angle of Yaw	5.46	31.0 deg/in.	
16				
17				
18	AZ			

TABLE 4f  
TRACE SENSITIVITIES FOR  
DYNAMIC AIR LOADS MEASUREMENT PROGRAM  
TYPE I FLIGHT NO. 10, OSCILLOGRAPH NO. 6  
CONDITION NOS. 23, 27, 29, 31, 34, 38, 42, 55, 58

No.	Oscillograph Channel	Trace Zero (Inches)	Calibration Constant	Droop
1	$\Delta P$ 95%R, 2% Ch	.13	9.62 p.s.i./in.	
2	$\Delta P$ 95%R, 9% Ch	.50	9.57 p.s.i./in.	
3	$\Delta P$ 95%R, 17% Ch	.99	10.53 p.s.i./in.	
4	$\Delta P$ 95%R, 23% Ch	1.65	5.16 p.s.i./in.	
5				
6	$\Delta P$ 95%R, 63% Ch	2.51	1.40 p.s.i./in.	
7	$\Delta P$ 95%R, 90% Ch	3.07	.44 p.s.i./in.	
8	Lift Link	3.32	5,667 lb/in.	
9	Rt Cyclic Tube	3.53	2,080 lb/in.	
10	Lt Cyclic Tube	3.92	2,256 lb/in.	
11	Coll Tube	4.39	1,984 lb/in.	
12	Rud Ped Pos	5.07	80.75 %/in.	
13	F & A Cyclic Pos	5.14	87.72 %/in.	
14	Lat Cyclic Pos	5.06	81.97 %/in.	
15	Coll Stick Pos	4.10	42.92 %/in.	
16	Stab. Bar Pos	4.96	10.34 %/in.	
17				
18	AZ			

TABLE 5a  
TRACE SENSITIVITIES FOR  
DYNAMIC AIR LOADS MEASUREMENT PROGRAM  
TYPE II FLIGHT NO. 12, OSCILLOGRAPH NO. 1  
CONDITION NOS. 65, 66, 67, 68

No.	Oscillograph Channel	Trace Zero (Inches)	Calibration Constant	Droop
1	Att Gyro Roll	3.34	18.3 deg/in.	
2				
3	Att Gyro Pitch	1.54	15.4 deg/in.	
4				
5				
6	$\Delta P$ 40%R, 4% Ch	.08	1.4 p.s.i./in.	
7	$\Delta P$ 40%R, 17% Ch	1.12	.8 p.s.i./in.	
8	$\Delta P$ 40%R, 34% Ch	1.66	.47 p.s.i./in.	
9	$\Delta P$ 40%R, 63% Ch	2.13	.18 p.s.i./in.	
10	$\Delta P$ 40%R, 88% Ch	3.76	.12 p.s.i./in.	
11				
12				
13				
14				
15	Roll Rate	2.74	13.4 deg/sec	
16	Pitch Rate	3.66	13.8 deg/sec	
17	Yaw Rate	4.34	13.4 deg/sec	
18	AZ			

TABLE 5b  
TRACE SENSITIVITIES FOR  
DYNAMIC AIR LOADS MEASUREMENT PROGRAM  
TYPE II FLIGHT NO. 12, OSCILLOGRAPH NO. 2  
CONDITION NOS. 65, 66, 67, 68

No.	Oscillograph Channel	Trace Zero (Inches)	Calibration Constant	Droop
1				
2				
3				
4				
5				
6				
7				
8	Red B1 Bm Bend. 15%R	.31	22,990 in.-lb/in.	-17,650 in.-lb
9	Red B1 Bm Bend. 28%R	.72	6,780 in.-lb/in.	-13,050 in.-lb
10	Red B1 Bm Bend. 36%R	.45	7,766 in.-lb/in.	-10,600 in.-lb
11	Red B1 Bm Bend. 45%R	1.53	8,144 in.-lb/in.	- 8,100 in.-lb
12	Red B1 Bm Bend. 60%R	2.62	7,465 in.-lb/in.	- 4,900 in.-lb
13	Red B1 Bm Bend. 65%R	3.32	7,809 in.-lb/in.	- 4,000 in.-lb
14	Red B1 Bm Bend. 80%R	4.55	7,779 in.-lb/in.	- 1,900 in.-lb
15	Red B1 Bm Bend. 92.5%R	5.35	9,461 in.-lb/in.	- 600 in.-lb
16				
17				
18	AZ			

TABLE 5c  
TRACE SENSITIVITIES FOR  
DYNAMIC AIR LOADS MEASUREMENT PROGRAM  
TYPE II FLIGHT NO. 12, OSCILLOGRAPH NO. 3  
CONDITION NOS. 65, 66, 67, 68

No.	Oscillograph Channel	Trace Zero (Inches)	Calibration Constant	Droop
1	$\Delta P$ 75%R, 2% Ch	0	1.88 p.s.i./in.	
2	$\Delta P$ 75%R, 9% Ch	.27	1.62 p.s.i./in.	
3	$\Delta P$ 75%R, 17% Ch	.42	1.15 p.s.i./in.	
4	$\Delta P$ 75%R, 23% Ch	.92	1.15 p.s.i./in.	
5	$\Delta P$ 75%R, 34% Ch	.82	1.30 p.s.i./in.	
6	$\Delta P$ 75%R, 63% Ch	2.15	.24 p.s.i./in.	
7	$\Delta P$ 75%R, 90% Ch	3.03	.15 p.s.i./in.	
8				
9				
10				
11				
12	Red B1 Tors 15%R	5.83	61,016 lb-in./in.	
13	Red B1 Tors 50%R	6.12	7,608 lb-in./in.	
14				
15				
16				
17				
18	AZ			



TABLE 5d  
TRACE SENSITIVITIES FOR  
DYNAMIC AIR LOADS MEASUREMENT PROGRAM  
TYPE II FLIGHT NO. 12, OSCILLOGRAPH NO. 4  
CONDITION NOS. 65, 66, 67, 68

No.	Oscillograph Channel	Trace Zero (Inches)	Calibration Constant	Droop
1	$\Delta P$ 85%R, 2% Ch	- .05	3.53 p.s.i./in.	
2	$\Delta P$ 85%R, 4% Ch	.16	3.70 p.s.i./in.	
3	$\Delta P$ 85%R, 9% Ch	.60	3.00 p.s.i./in.	
4	$\Delta P$ 85%R, 13% Ch	.82	2.09 p.s.i./in.	
5	$\Delta P$ 85%R, 17% Ch	1.17	4.17 p.s.i./in.	
6	$\Delta P$ 85%R, 23% Ch	3.59	3.08 p.s.i./in.	
7	$\Delta P$ 85%R, 34% Ch	3.17	1.65 p.s.i./in.	
8				
9	$\Delta P$ 85%R, 63% Ch	2.46	.40 p.s.i./in.	
10	$\Delta P$ 85%R, 77% Ch	3.61	.40 p.s.i./in.	
11	$\Delta P$ 85%R, 90% Ch	4.77	.44 p.s.i./in.	
12				
13				
14				
15				
16				
17				
18	AZ			

TABLE 5e  
TRACE SENSITIVITIES FOR  
DYNAMIC AIR LOADS MEASUREMENT PROGRAM  
TYPE II FLIGHT NO. 12, OSCILLOGRAPH NO. 5  
CONDITION NOS. 65, 66, 67, 68

No.	Oscillograph Channel	Trace Zero (Inches)	Calibration Constant	Droop
1	$\Delta P$ 90%R, 2% Ch	0	4.08 p.s.i./in.	
2	$\Delta P$ 90%R, 9% Ch	.57	3.68 p.s.i./in.	
3	$\Delta P$ 90%R, 17% Ch	1.69	5.00 p.s.i./in.	
4	$\Delta P$ 90%R, 23% Ch	.39	2.09 p.s.i./in.	
5	$\Delta P$ 90%R, 34% Ch	1.77	1.65 p.s.i./in.	
6	$\Delta P$ 90%R, 63% Ch	3.32	.70 p.s.i./in.	
7	$\Delta P$ 90%R, 90% Ch	4.92	.34 p.s.i./in.	
8	Red Blade Pitch Pos	3.36	12.0 deg/in.	9.5 deg/in.
9	Red Blade Flap Pos	5.61	10.0 deg/in.	
10				
11				
12				
13				
14	Angle of Attack	4.82	26.9 deg/in.	
15	Angle of Yaw	5.50	30.0 deg/in.	
16				
17				
18	AZ			

TABLE 5f  
TRACE SENSITIVITIES FOR  
DYNAMIC AIR LOADS MEASUREMENT PROGRAM  
TYPE II FLIGHT NO. 12, OSCILLOGRAPH NO. 6  
CONDITION NOS. 65, 66, 67, 68

No.	Oscillograph Channel	Trace Zero (Inches)	Calibration Constant	Droop
1	$\Delta P$ 95%R, 2% Ch	.09	3.94 p.s.i./in.	
2	$\Delta P$ 95%R, 9% Ch	.80	4.25 p.s.i./in.	
3	$\Delta P$ 95%R, 17% Ch	1.99	4.46 p.s.i./in.	
4	$\Delta P$ 95%R, 23% Ch	1.17	2.14 p.s.i./in.	
5				
6	$\Delta P$ 95%R, 63% Ch	2.50	.60 p.s.i./in.	
7	$\Delta P$ 95%R, 90% Ch	4.51	.19 p.s.i./in.	
8				
9				
10				
11				
12	Rud Ped Pos	5.29	40 %/in.	
13	F & A Cyclic Pos	5.32	44.4 %/in.	
14	Lat Cyclic Pos	5.31	40.3 %/in.	
15	Coll Stick Pos	5.50	41.5 %/in.	
16				
17				
18	AZ			

TABLE 6a

## GROUP IB DATA - TYPE I FLIGHTS

## CONDITION NO. 23 MAXIMUM POWER CLIMB

Identification	Revolution No. 1	Revolution No. 2	Revolution No. 3	Average
Att. Gyro Roll (Deg)	-0.6	-0.6	-0.7	-0.6
Att. Gyro Pitch (Deg)	4.5	4.5	4.5	4.5
Roll Rate (Deg/Sec)	-0.4	-0.5	-0.8	-0.6
Pitch Rate (Deg/Sec)	0.3	0.1	0	0.1
Yaw Rate (Deg/Sec)	-0.3	0	0.4	0
Angle of Attack Vane (Deg)	25.6	25.9	26.2	25.9
Yaw Vane (Deg)	-2.8	-3.4	-5.0	-3.7
Rud Pedal Pos (%) *	33.1 Left	33.9 Left	33.9 Left	33.6 Left
F & A Cyclic Pos (%) *	32.5 Fwd	32.5 Fwd	32.5 Fwd	32.5 Fwd
Lat Cyclic Pos (%) *	1.6 Left	4.9 Left	4.1 Left	3.5 Left
Coll Stick Pos (%)	47.5	47.5	47.5	47.5

\*Calculated from neutral position = 0%

Photo Panel Film Frame Nos. 1 through 10

I.A.S. 19  $V_{true}$  20 KnotsO.A.T.<sub>corr</sub> 23°C $H_p$  1780  $H_D$  3150 Feet

Engine r.p.m. 6390 Rotor r.p.m. 313

GW 6085  $GW/\sigma'$  6680 PoundsSHP 467  $SHP/\sigma'$  513

TABLE 6b

## GROUP IB DATA - TYPE I FLIGHTS

## CONDITION NO. 27 STRAIGHT AND LEVEL FLIGHT

Identification	Revolution No. 1	Revolution No. 2	Revolution No. 3	Average
Att. Gyro Roll (Deg)	-1.8	-1.7	-1.7	-1.7
Att. Gyro Pitch (Deg)	-0.3	-0.2	-0.3	-0.3
Roll Rate (Deg/Sec)	0.1	0.3	0.4	0.3
Pitch Rate (Deg/Sec)	0.1	0.1	0.1	0.1
Yaw Rate (Deg/Sec)	-0.8	-0.8	-0.8	-0.8
Angle of Attack Vane (Deg)	1.4	1.4	1.4	1.4
Yaw Vane (Deg)	9.0	9.0	9.0	9.0
Rud Pedal Pos (%) *	4.8 Right	4.8 Right	4.8 Right	4.8 Right
F & A Cyclic Pos (%) *	21.9 Fwd	21.9 Fwd	21.9 Fwd	21.9 Fwd
Lat Cyclic Pos (%) *	7.4 Left	8.2 Left	8.2 Left	7.9 Left
Coll Stick Pos (%)	46.6	46.2	46.2	41.3

\*Calculated from neutral position = 0%

Photo Panel Film Frame Nos. 1 through 8

I.A.S. 32.5  $V_{true}$  34 KnotsO.A.T.<sub>corr</sub> 23.5°C $H_p$  1950  $H_D$  3350 Feet

Engine r.p.m. 6390 Rotor r.p.m. 313

GW 6053  $GW/\sigma'$  6680 PoundsSHP 450  $SHP/\sigma'$  497

TABLE 6c

## GROUP IB DATA - TYPE I FLIGHTS

## CONDITION NO. 29 STRAIGHT AND LEVEL FLIGHT

Identification	Revolution No. 1	Revolution No. 2	Revolution No. 3	Average
Att. Gyro Roll (Deg)	0	0	0	0
Att. Gyro Pitch (Deg)	-0.8	-0.8	-0.8	-0.8
Roll Rate (Deg/Sec)	0.1	-0.1	-0.1	0
Pitch Rate (Deg/Sec)	0.3	0.3	0.3	0.3
Yaw Rate (Deg/Sec)	-0.5	-0.4	-0.2	-0.4
Angle of Attack Vane (Deg)	-1.4	-1.4	-1.4	-1.4
Yaw Vane (Deg)	-3.4	-3.4	-3.4	-3.4
Rud Pedal Pos (%) *	14.5 Right	14.5 Right	14.5 Right	14.5 Right
F & A Cyclic Pos (%) *	49.0 Fwd	49.1 Fwd	49.1 Fwd	49.1 Fwd
Lat Cyclic Pos (%) *	7.4 Left	5.7 Left	5.7 Left	6.3 Left
Coll Stick Pos (%)	56.8	56.8	56.8	56.8

\*Calculated from neutral position = 0%

Photo Panel Film Frame Nos. 1 through 5

I.A.S. 84  $V_{true}$  88.5 KnotsO.A.T.<sub>corr</sub> 24°C $H_p$  2040  $H_D$  3500 Feet

Engine r.p.m. 6370 Rotor r.p.m. 312

GW 6043  $GW/\sigma'$  6700 PoundsSHP 508  $SHP/\sigma'$  563

TABLE 6d

## GROUP IB DATA - TYPE I FLIGHTS

## CONDITION NO. 31 STRAIGHT AND LEVEL FLIGHT

Identification	Revolution No. 1	Revolution No. 2	Revolution No. 3	Average
Att. Gyro Roll (Deg)	-1.3	-1.5	-1.5	-1.4
Att. Gyro Pitch (Deg)	-4.5	-4.3	-4.5	-4.4
Roll Rate (Deg/Sec)	-0.4	-0.3	-0.1	-0.3
Pitch Rate (Deg/Sec)	0.3	0.3	0.3	0.3
Yaw Rate (Deg/Sec)	-0.4	-0.5	-0.6	-0.5
Angle of Attack Vane (Deg)	-6.7	-6.2	-6.5	-6.5
Yaw Vane (Deg)	-1.6	-1.6	-1.6	-1.6
Rud Pedal Pos (%) *	2.4 Left	1.7 Left	0	1.3 Left
F & A Cyclic Pos (%) *	61.4 Fwd	62.3 Fwd	60.5 Fwd	61.4 Fwd
Lat Cyclic Pos (%) *	14.8 Left	13.9 Left	16.4 Left	15.0 Left
Coll Stick Pos (%)	76.4	76.4	76.4	76.4

\*Calculated from neutral position = 0%

Photo Panel Film Frame Nos. 1 through 5

I.A.S. 107.5  $V_{true}$  113.5 KnotsO.A.T.<sub>corr</sub> 23.5°CH<sub>P</sub> 2160 H<sub>D</sub> 3650 Feet

Engine r.p.m. 6350 Rotor r.p.m. 311.5

GW 6027 GW/ $\sigma$  6719 PoundsSHP 768 SHP/ $\sigma$  856

TABLE 6e

## GROUP IB DATA - TYPE I FLIGHTS

## CONDITION NO. 42 HOVER OGE

Identification	Revolution No. 1	Revolution No. 2	Revolution No. 3	Average
Att. Gyro Roll (Deg)	-2.7	-2.7	-2.9	-2.8
Att. Gyro Pitch (Deg)	2.8	2.8	2.9	2.8
Roll Rate (Deg/Sec)	-0.7	-0.7	-0.7	-0.7
Pitch Rate (Deg/Sec)	0	0.3	0.3	0.2
Yaw Rate (Deg/Sec)	0.4	0.2	0	0.2
Angle of Attack Vane (Deg)	-13.8	-7.0	1.1	-6.6
Yaw Vane (Deg)	31.7	31.7	30.8	31.4
Rud Pedal Pos (%) *	35.5 Left	35.5 Left	35.5 Left	35.5 Left
F & A Cyclic Pos (%) *	8.8 Fwd	9.6 Fwd	9.6 Fwd	9.3 Fwd
Lat Cyclic Pos (%) *	18.0 Left	18.0 Left	18.0 Left	18.0 Left
Coll Stick Pos (%)	57.3	56.8	57.3	57.1

\*Calculated from neutral position = 0%

Photo Panel Film Frame Nos. 1 through 8

I.A.S. 0  $V_{true}$  0 KnotsO.A.T.<sub>corr</sub> 23.5°C $H_p$  605  $H_D$  1600 Feet

Engine r.p.m. 6390 Rotor r.p.m. 311.5

GW 6125  $GW/\sigma$  6420 PoundsSHP 669  $SHP/\sigma$  701



TABLE 6f

## GROUP IB DATA - TYPE I FLIGHTS

## CONDITION NO. 55 HIGH ALTITUDE STALL THRESHOLD

Identification	Revolution No. 1	Revolution No. 2	Revolution No. 3	Average
Att. Gyro Roll (Deg)	-0.7	-0.9	-0.7	-0.8
Att. Gyro Pitch (Deg)	-0.8	-0.8	-0.8	-0.8
Roll Rate (Deg/Sec)	0	-0.3	-0.3	-0.2
Pitch Rate (Deg/Sec)	0	-0.3	-0.4	-0.2
Yaw Rate (Deg/Sec)	-0.5	-0.5	-0.5	-0.5
Angle of Attack Vane (Deg)	-0.3	-0.3	-0.3	-0.3
Yaw Vane (Deg)	-6.2	-6.2	-6.2	-6.2
Rud Pedal Pos (%) *	16.1 Left	20.2 Left	20.2 Left	18.8 Left
F & A Cyclic Pos (%) *	59.6 Fwd	59.6 Fwd	58.8 Fwd	59.3 Fwd
Lat Cyclic Pos (%) *	13.1 Left	18.0 Left	18.9 Left	16.7 Left
Coll Stick Pos (%)	71.7	71.7	71.7	71.7

\*Calculated from neutral position = 0%

Photo Panel Film Frame Nos. 1 through 6

I.A.S. 77  $V_{true}$  90.7 KnotsO.A.T.<sub>corr</sub> 9.5°CH<sub>p</sub> 9325 H<sub>D</sub> 10,725 Feet

Engine r.p.m. 6550 Rotor r.p.m. 318.6

GW 6273  $GW/\sigma'$  8700 PoundsSHP 649  $SHP/\sigma'$  900

TABLE 6g

## GROUP IB DATA - TYPE I FLIGHTS

## CONDITION NO. 58 HIGH ALTITUDE FLIGHT

Identification	Revolution No. 1	Revolution No. 2	Revolution No. 3	Average
Att. Gyro Roll (Deg)	0.4	0.5	0.7	0.5
Att. Gyro Pitch (Deg)	-2.8	-2.6	-2.6	-2.7
Roll Rate (Deg/Sec)	-0.3	0.1	0.1	0
Pitch Rate (Deg/Sec)	-0.4	-0.3	-0.1	-0.3
Yaw Rate (Deg/Sec)	-0.3	-0.3	-0.4	-0.3
Angle of Attack Vane (Deg)	-3.2	-3.0	-3.0	-3.1
Yaw Vane (Deg)	-10.3	-9.9	-9.9	-10.0
Rud Pedal Pos (%) *	15.3 Left	14.5 Left	14.5 Left	14.8 Left
F & A Cyclic Pos (%) *	43.9 Fwd	43.9 Fwd	44.7 Fwd	44.2 Fwd
Lat Cyclic Pos (%) *	10.7 Left	9.8 Left	10.7 Left	10.4 Left
Coll Stick Pos (%)	63.6	63.6	63.6	63.6

\*Calculated from neutral position = 0%

Photo Panel Film Frame Nos. 1 through 8

I.A.S. 67  $V_{true}$  78.9 KnotsO.A.T.<sub>corr</sub> 9.5°CH<sub>P</sub> 9350 H<sub>D</sub> 10,750 Feet

Engine r.p.m. 6600 Rotor r.p.m. 321.2

GW 6260  $GW/\sigma$  8682 PoundsSHP 579  $SHP/\sigma$  803

TABLE 7a

## GROUP IB DATA - TYPE II FLIGHTS

## CONDITION NO. 65 STRAIGHT AND LEVEL FLIGHT

Identification	Revolution No. 1	Revolution No. 2	Revolution No. 3	Average
Att. Gyro Roll (Deg)	-0.6	-0.7	-0.7	-0.7
Att. Gyro Pitch (Deg)	-1.5	-1.5	-1.5	-1.5
Roll Rate (Deg/Sec)	-0.3	-0.4	-0.3	-0.3
Pitch Rate (Deg/Sec)	-0.4	-0.3	0	-0.2
Yaw Rate (Deg/Sec)	-0.9	-1.9	-2.5	-1.8
Angle of Attack Vane (Deg)	3.8	4.0	3.2	3.7
Yaw Vane (Deg)	-13.5	-13.2	-13.2	-13.2
Rud Pedal Pos (%) *	5.6 Left	4.8 Left	4.8 Left	5.1 Left
F & A Cyclic Pos (%) *	24.0 Fwd	24.9 Fwd	24.9 Fwd	24.6 Fwd
Lat Cyclic Pos (%) *	15.3 Left	12.9 Left	12.1 Left	13.4 Left
Coll Stick Pos (%)	44.2	44.2	44.2	44.2

\*Calculated from neutral position = 0%

Photo Panel Film Frame Nos. 1 through 15

I.A.S. 31  $V_{true}$  32.6 KnotsO.A.T.<sub>corr</sub> 29.5°C $H_P$  1390  $H_D$  3380 Feet

Engine r.p.m. 6410 Rotor r.p.m. 312

GW 6085  $GW/\sigma'$  6731 PoundsSHP 433  $SHP/\sigma'$  479

TABLE 7b

## GROUP IB DATA - TYPE II FLIGHTS

## CONDITION NO. 66 STRAIGHT AND LEVEL FLIGHT

Identification	Revolution No. 1	Revolution No. 2	Revolution No. 3	Average
Att. Gyro Roll (Deg)	1.8	1.8	2.2	2.0
Att. Gyro Pitch (Deg)	-1.7	-1.7	-1.5	-1.6
Roll Rate (Deg/Sec)	1.2	0.9	0.1	0.7
Pitch Rate (Deg/Sec)	-0.4	-0.1	-0.1	-0.2
Yaw Rate (Deg/Sec)	-1.6	-1.7	-1.3	-1.5
Angle of Attack Vane (Deg)	-0.5	-0.5	-0.5	-0.5
Yaw Vane (Deg)	-4.5	-4.8	-5.4	-4.9
Rud Pedal Pos (%) *	16.0 Right	16.0 Right	16.0 Right	16.0 Right
F & A Cyclic Pos (%) *	48.9 Fwd	48.9 Fwd	48.9 Fwd	48.9 Fwd
Lat Cyclic Pos (%) *	12.1 Left	12.1 Left	12.1 Left	12.1 Left
Coll Stick Pos (%)	51.3	51.6	51.3	51.4

\*Calculated from neutral position = 0%

Photo Panel Film Frame Nos. 1 through 12

I.A.S. 87.5  $V_{true}$  92 KnotsO.A.T.<sub>corr</sub> 29°C $H_p$  1375  $H_D$  3300 Feet

Engine r.p.m. 6420 Rotor r.p.m. 314

GW 6420  $GW/\sigma$  ' 6660 PoundsSHP 6040  $SHP/\sigma$  ' 528

TABLE 7c

## GROUP IB DATA - TYPE II FLIGHTS

## CONDITION NO. 67 STRAIGHT AND LEVEL FLIGHT

Identification	Revolution No. 1	Revolution No. 2	Revolution No. 3	Average
Att. Gyro Roll (Deg)	-1.1	-0.5	-0.4	-0.7
Att. Gyro Pitch (Deg)	-3.4	-3.5	-3.7	-3.5
Roll Rate (Deg/Sec)	1.2	1.7	2.1	1.7
Pitch Rate (Deg/Sec)	-0.4	-0.6	-0.4	-0.5
Yaw Rate (Deg/Sec)	0.3	-0.5	-0.9	-0.4
Angle of Attack Vane (Deg)	-8.6	-8.6	-8.6	-8.6
Yaw Vane (Deg)	-1.2	-1.2	-1.2	-1.2
Rud Pedal Pos (%) *	1.6 Right	3.2 Right	3.2 Right	2.7 Right
F & A Cyclic Pos (%) *	67.5 Fwd	67.5 Fwd	67.5 Fwd	67.5 Fwd
Lat Cyclic Pos (%) *	16.9 Left	18.6 Left	18.6 Left	18.0 Left
Coll Stick Pos (%)	77.8	77.8	77.8	77.8

\*Calculated from neutral position = 0%

Photo Panel Film Frame Nos. 1 through 13

I.A.S. 106  $V_{true}$  111.3 KnotsO.A.T.<sub>corr</sub> 29°C $H_p$  1375  $H_D$  3300 Feet

Engine r.p.m. 6410 Rotor r.p.m. 313

GW 6033  $GW/\sigma'$  6652 PoundsSHP 758  $SHP/\sigma'$  836

TABLE 7d

## GROUP IB DATA - TYPE II FLIGHTS

## CONDITION NO. 68 STRAIGHT AND LEVEL FLIGHT

Identification	Revolution No. 1	Revolution No. 2	Revolution No. 3	Average
Att. Gyro Roll (Deg)	0.5	0.2	-0.2	0.2
Att. Gyro Pitch (Deg)	-4.3	-4.5	-4.5	-4.4
Roll Rate (Deg/Sec)	-0.3	-0.8	-1.1	-0.7
Pitch Rate (Deg/Sec)	0.1	0	-0.1	0
Yaw Rate (Deg/Sec)	0	0.3	0.5	0.3
Angle of Attack Vane (Deg)	-7.0	-6.7	-6.7	-6.8
Yaw Vane (Deg)	-3.0	-3.3	-3.3	-3.2
Rud Pedal Pos (%) *	4.8 Right	4.8 Right	4.8 Right	4.8 Right
F & A Cyclic Pos (%) *	65.8 Fwd	63.1 Fwd	63.1 Fwd	64.0 Fwd
Lat Cyclic Pos (%) *	15.3 Left	15.3 Left	16.9 Left	15.9 Left
Coll Stick Pos (%)	77.9	77.9	77.5	77.7

\*Calculated from neutral position = 0%

Photo Panel Film Frame Nos. 1 through 19

I.A.S. 105  $V_{true}$  110.4 Knots

O.A.T.<sub>corr</sub> 29°C

H<sub>p</sub> 1450 H<sub>D</sub> 3400 Feet

Engine r.p.m. 6630 Rotor r.p.m. 324

GW 6027 GW/ $\sigma'$  6667 Pounds

SHP 757 SHP/ $\sigma'$  837

TABLE 8a  
GROUP IB DATA - MANEUVER CONDITIONS

CONDITION NO. 34, SYMMETRICAL PULL-UP

Identification	Revolution No. 1 Time = 0	Revolution No. 2 Time = 1.15	Revolution No. 3 Time = 2.11	Revolution No. 4 Time = 3.07	Revolution No. 5 Time = 4.22
Att. Gyro Roll (Deg)	-0.6	-0.9	0.4	1.1	1.1
Att. Gyro Pitch (Deg)	-2.0	0.6	9.4	14.3	12.9
Roll Rate (Deg/Sec)	-0.5	1.3	-0.8	2.8	-0.4
Pitch Rate (Deg/Sec)	0.7	5.2	6.6	2.5	-1.8
Yaw Rate (Deg/Sec)	-0.3	-0.1	1.5	-1.2	-1.6
Angle of Attack Vane (Deg)	-2.7	-2.2	4.1	4.9	-0.5
Yaw Vane (Deg)	-3.7	-3.4	-2.2	-1.9	-5.0
Rud Pedal Pos (%) *	10.5 Rt	9.7 Rt	3.2 Rt	4.0 Rt	1.6 Rt
F & A Cyclic Pos (%) *	45.6 Fwd	28.9 Fwd	44.7 Fwd	48.2 Fwd	48.2 Fwd
Lat Cyclic Pos (%) *	12.3 Lt	12.3 Lt	11.5 Lt	17.2 Lt	17.2 Lt
Coll Stick Pos (%)	58.1	52.8	54.0	53.2	52.4
V <sub>true</sub> (Knots)	92.2	92.2	90.0	87.6	82.7
Density Alt (Ft)	3900	3900	3900	4050	4400
Rotor RPM	312.5	315.5	311.0	311.0	315.5
SHP/ $\sigma'$	606	626	666	669	674
GW/ $\sigma'$ (Lb)	6742	6742	6742	6772	6850
OAT (°C)	22.5	22.5	22.5	22.5	22.5

\*Calculated from neutral position = 0%

TABLE 8b

## GROUP IB DATA - MANEUVER CONDITIONS

CONDITION NO. 38, APPROACH AND FLARE, 50-0 KNOTS

Identification	Revolution No. 1 Time = 0	Revolution No. 2 Time = 0.97	Revolution No. 3 Time = 1.95	Revolution No. 4 Time = 2.93	Revolution No. 5 Time = 3.91
Att. Gyro Roll (Deg)	-2.7	-2.7	-2.2	-2.0	-2.4
Att. Gyro Pitch (Deg)	9.9	8.8	10.3	11.4	11.6
Roll Rate (Deg/Sec)	1.6	0	1.2	-0.4	-0.3
Pitch Rate (Deg/Sec)	-1.4	0.3	1.5	0.7	-1.0
Yaw Rate (Deg/Sec)	-4.4	-2.8	-2.7	-0.7	0.4
Angle of Attack Vane (Deg)	--	--	--	--	--
Yaw Vane (Deg)	-1.6	-1.2	-1.2	-0.3	-0.9
Rud Pedal Pos (%) *	22.5 Rt	4.0 Rt	8.1 Lt	19.4 Lt	27.4 Lt
F & A Cyclic Pos (%) *	2.6 Fwd	12.3 Fwd	22.8 Fwd	23.7 Fwd	26.3 Fwd
Lat Cyclic Pos (%) *	18.9 Lt	17.2 Lt	17.2 Lt	16.4 Lt	14.8 Lt
Coll Stick Pos (%)	35.1	45.3	53.4	56.8	56.8
V <sub>true</sub> (Knots)	19.4	11.3	5.1	0	0
Density Alt (Ft)	1600	1600	1600	1700	1700
Rotor RPM	309.0	307.5	306.0	304.5	306.0
SHP/ $\sigma'$	306	387	491	599	626
GW/ $\sigma'$ (Lb)	6269	6269	6269	6289	6289
OAT (°C)	22.5	22.5	22.5	23.5	23.5

\*Calculated from neutral position = 0%



IBM TABULATIONS

IBM TAB NO. 1  
TYPE I STEADY STATE CONDITION NO. 23  
MAXIMUM POWER CLIMB

		40			DELTA PER CENT			PRESSURE RADIUS					
PFR	CENT				D	E	G	R	E	E	S		
(CHORD		K	0+(1120)K			30+(1120)K			60+(1120)K			90+(1120)K	
4		0	3052830051				2666840051				2421210051	1894860051	17123
		1	2140490051				2070310051				2140490051	1298330051	18123
		2	1596595051				1965040051				2421210051	2859835051	19123
17		0	1445310051				1290780051				1127160051	8181000050	27123
		1	1099890051				1090800051				1045350051	6453900050	28123
		2	6908400050				8908200050				1236240051	1499850051	29123
34		0	7320000050				6720000050				5640000050	4680000050	37123
		1	5640000050				5640000050				5640000050	3480000050	38123
		2	4200000050				4000000050				6120000050	6960000050	39123
63		0	3116900050				2634000050				2414500050	2107200050	47123
		1	2370600050				2677900050				2392550050	1821850050	48123
		2	1909650050				2238900050				2809600050	3116900050	49123
88		0	1266900050				9888000049				8961000049	8961000049	57123
		1	1035150050				1205100050				1081500050	6798000049	58123
		2	8034000049				9888000049				1174200050	1375050050	59123

		55	DELTA PER CENT		PRESSURE RADIUS		
PER CENT CHORD	K	0+(120)K	D E G 30+(120)K	R E E S 60+(120)K	90+(120)K		
2	0	5391360051	4446720051	3755520051	3778560051	147223	
	1	4469760051	4285440051	4561920051	2580480051	148223	
	2	2949120051	3732480051	4285440051	5091840051	149223	
9	0	3408750051	2772450051	2454300051	2408850051	157223	
	1	2886075051	2727000051	2749725051	1772550051	158223	
	2	1954350051	2408850051	2772450051	3226950051	159223	
17	0	2351030051	2105400051	1772045051	1859770051	167223	
	1	2070310051	2000130051	2000130051	1280785051	168223	
	2	1403600051	1789590051	1929950051	2280850051	169223	
23	0	1884680051	1635760051	1386840051	1422400051	177223	
	1	1671320051	1564640051	1564640051	1066800051	178223	
	2	1102360051	1351280051	1564640051	1813560051	179223	
34	0	1650000051	1485000051	1306800051	1372800051	187223	
	1	1491600051	1425600051	1399200051	1095600051	188223	
	2	1108800051	1280400051	1425600051	1597200051	189223	
63	0	5291000050	4477000050	3703700050	4497350050	197223	
	1	4721200050	4680500050	4477000050	3703700050	198223	
	2	3500200050	3988600050	4721200050	5291000050	199223	
90	0	2136000050	2002500050	1682100050	2095950050	207223	
	1	2109300050	2069250050	1975800050	1735500050	208223	
	2	1495200050	1708800050	2002500050	2189400050	209223	

PER CENT CHORD	K	75	DELTA PER CENT	PRESSURE RADIUS		
			D E G	R E E S		
		0+11201K	30+11201K	60+11201K		90+11201K
2	0	6933990051	5047190051	6981160051	5943420051	377323
	1	6320780051	6132100051	6226440051	6462290051	378323
	2	4433980051	5283040051	6462290051	7358520051	379323
9	0	4237000051	3241305051	4279370051	3940410051	387323
	1	4152260051	3813300051	3601450051	3855670051	388323
	2	2987085051	3177750051	3770930051	4406480051	389323
17	0	2556900051	1761420051	2599515051	2130750051	397323
	1	2244390051	2230185051	2244390051	2414850051	398323
	2	1704600051	1846650051	2358030051	2784180051	399323
23	0	2668730051	1995070051	2720550051	2293035051	407323
	1	2409630051	2331900051	2305990051	2409630051	408323
	2	1839610051	1969160051	2435540051	2850100051	409323
34	0	1619370051	1136400051	1676190051	1306860051	417323
	1	1448910051	1392090051	1463115051	1505730051	418323
	2	51170051	1193220051	1477320051	1690395051	419323
63	0	6922800050	5544650050	7243300050	6410000050	427323
	1	6986900050	6538200050	7179200050	7115100050	428323
	2	6217700050	5512600050	6922800050	8204800050	429323
90	0	3461250050	2946500050	3834000050	3319250050	437323
	1	3763000050	3479000050	3692000050	3479000050	438323
	2	3266000050	2911000050	3283750050	3550000050	439323

PER CENT CHORD	K	85		DELTA PER CENT		PRESSURE RADIUS	
		0+(120)K	D E G	30+(120)K	R E E S	60+(120)K	90+(120)K
2	0	7012655051	3983520051	8008535051	6514715051	607423	
	1	6805180051	7552090051	7386110051	7801060051	608423	
	2	9294880051	4813420051	7635080051	8381990051	609423	
4	0	6711195051	3644490051	7955655051	6222300051	617423	
	1	6311190051	7200090051	6844530051	7022310051	618423	
	2	8444550051	4311165051	7022310051	7911210051	619423	
9	0	5102505051	3013560051	6198345051	4862790051	627423	
	1	4862790051	5205240051	4999770051	5068260051	628423	
	2	5684670051	3219030051	4999770051	5821650051	629423	
13	0	3588250051	1828850051	4977250051	3287300051	637423	
	1	3379900051	3750300051	3565100051	3750300051	638423	
	2	4213300051	2315000051	3704000051	4167000051	639423	
17	0	3480420051	1715700051	4117680051	3039240051	647423	
	1	3137280051	3431400051	3137280051	3529440051	648423	
	2	3627480051	1960800051	3235320051	3823560051	649423	
23	0	2631600051	1666680051	3212745051	2543880051	657423	
	1	2565810051	2708355051	2565810051	2719320051	658423	
	2	2982480051	1765365051	2653530051	2938620051	659423	
34	0	1706550051	9358500050	1981800051	1623975051	667423	
	1	1633150051	1761600051	1743250051	1890050051	668423	
	2	2073550051	1174400051	1743250051	1945100051	669423	
47.7	0					677423	
	1					678423	
	2					679423	
63	0	5807200050	2570400050	7520800050	5236000050	687423	
	1	6378400050	6473600050	6568800050	7425600050	688423	
	2	8377600050	4664800050	6664000050	7520800050	689423	
77	0	1706400050	5688000049-	2512200050	1327200050	697423	
	1	2275200050	2275200050	2749200050	3223200050	698423	
	2	3886800050	1422000050	2654400050	2749200050	699423	
90	0	5658000049-	1414500050-		8015500049-	707423	
	1	4715000048-	9430000048-	1886000049	2829000049	708423	
	2	1131600050	3772000049-	1886000049	2829000049	709423	

PER CENT CHORD	K	90			DELTA PER CENT		PRESSURE RADIUS	
		O+(120)K			D E G		R E E S	
					30+(120)K		60+(120)K	
2	0	7037030051	2857140051	9100520051	6984120051	797523		
	1	7195760051	8148140051	8253960051	9312160051	798523		
	2	9999990051	4656080051	8571420051	8888880051	799523		
9	0	4331990051	1382550051	6544070051	4424160051	807523		
	1	4424160051	5069350051	4700670051	4977180051	808523		
	2	5299775051	2765100051	4977180051	5253690051	809523		
17	0	3905220051	1656760051	5857830051	3786880051	817523		
	1	4022560051	4141900051	3905220051	4615260051	818523		
	2	4970280051	2366800051	4378580051	4378580051	819523		
23	0	2598060051	1544130051	3480420051	2598060051	827523		
	1	2647080051	2696100051	2598060051	2990220051	828523		
	2	3382380051	1764720051	2843160051	2941200051	829523		
34	0	1481600051	5370800050	2129800051	1407520051	837523		
	1	1518640051	1648280051	1481600051	1852000051	838523		
	2	2074240051	8889600050	1703840051	1777920051	839523		
63	0	4279600050	2222'00050	6254800050	4279600050	847523		
	1	5596400050	5184900050	5843300050	6584000050	848523		
	2	8394600050	3785800050	5925600050	6254800050	849523		
90	0	2655000049-	1416000050-	3540000049-	6195000049-	857523		
	1	8850000048	3097500049	6195000049	9735000049	858523		
	2	1725750050	2655000049	5310000049		859523		

PER CENT CHORD	K	95			DELTA PER CENT		PRESSURE RADIUS	
		O+(120)K			D E G		R E E S	
					30+(120)K		60+(120)K	
2	0	5528625051	1538400051	7307400051	5672850051	967623		
	1	4807500051	5720925051	5769000051	7018950051	968623		
	2	7980450051	3605625051	6586275051	6634350051	969623		
9	0	4497430051	1243970051	6698300051	4593120051	977623		
	1	4210360051	4784500051	4593120051	5550020051	978623		
	2	6028470051	2918545051	5215105051	5358640051	979623		
17	0	3157800051	1421010051	6420860051	3263060051	987623		
	1	3157800051	3473580051	3263060051	3578840051	988623		
	2	4263030051	2105200051	3684100051	3894620051	989623		
23	0	2010450051	7732500050	3531175051	2062000051	997623		
	1	1855800051	2165100051	2113550051	2525950051	998623		
	2	2835250051	1469175051	2371300051	2371300051	999623		
34	0					1007623		
	1					1008623		
	2					1009623		
63	0	4194000050	1817400050	5172600050	4054200050	1017623		
	1	4753200050	5592000050	5731800050	6850200050	1018623		
	2	7409400050	3984300050	5452200050	5312400050	1019623		
90	0	4350000048	3045000049-	3697500049-	3045000049-	1027623		
	1	1522500049	4785000049	4785000049	7830000049	1028623		
	2	6090000049	6525000049	1740000049	4350000048	1029623		

		40		BLADE PER CENT	LOADING RADIUS		
				D E G	R E E S		
K		0+(120)K	30+(120)K	60+(120)K	90+(120)K		
0	1126639752	9906065451	8784797651	7048365351	17023		
1	8345739551	8447065151	8231112551	5270928651	18023		
2	6114173451	7403674751	9411255651	1097484852	19023		
		55		BLADE PER CENT	LOADING RADIUS		
				D E G	R E E S		
K		0+(120)K	30+(120)K	60+(120)K	90+(120)K		
0	2034400252	1750843452	1504439152	1586653552	27023		
1	1781960052	1710681052	1710406752	1197255352	28023		
2	1247856452	1503966252	1707589752	1964136952	29023		
		75		BLADE PER CENT	LOADING RADIUS		
				D E G	R E E S		
K		0+(120)K	30+(120)K	60+(120)K	90+(120)K		
0	2428457452	1803567252	2490810652	2121839152	37023		
1	2291456252	2171432752	2212462152	2290552552	38023		
2	1731572652	1835108652	2250289552	2606213152	39023		
		85		BLADE PER CENT	LOADING RADIUS		
				D E G	R E E S		
K		0+(120)K	30+(120)K	60+(120)K	90+(120)K		
0	2507592552	1318249152	3069134052	2326036452	47023		
1	2434734652	2638373152	2559830952	2732200752	48023		
2	3095648752	1665673852	2607101752	2941608652	49023		
		90		BLADE PER CENT	LOADING RADIUS		
				D E G	R E E S		
K		0+(120)K	30+(120)K	60+(120)K	90+(120)K		
0	2316834552	8987026151	3321655852	2275965852	57023		
1	2444814052	2631617052	2548218252	2928895252	58023		
2	3266769852	1529736352	2748269752	2832692952	59023		
		95		BLADE PER CENT	LOADING RADIUS		
				D E G	R E E S		
K		0+(120)K	30+(120)K	60+(120)K	90+(120)K		
0	1945546252	6795643451	3049163152	1967764252	67023		
1	1879413552	2171152252	2126051652	2523672852	68023		
2	2816725552	1407363552	2322676252	2355428652	69023		

BLADE 0	LOADING AZIMUTH				BLADE 180	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			1126639752		40			8231112551	
55			2034400252		55			1710406752	
75			2428457452		75			2212462152	
85			2507592552		85			2559830952	
90			2316834552		90			2548218252	
95			1945546252		95			2126051652	
BLADE 30	LOADING AZIMUTH				BLADE 210	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			9906065451		40			5270928651	
55			1750843452		55			1197255352	
75			1803567252		75			2290552552	
85			1318249152		85			2732200752	
90			8987026151		90			2928895252	
95			6795643451		95			2523672852	
BLADE 60	LOADING AZIMUTH				BLADE 240	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			8784797651		40			6114173451	
55			1504439152		55			1247856452	
75			2490810652		75			1731572652	
85			3069134052		85			3095648752	
90			3321655852		90			3266769852	
95			3049163152		95			2816725552	
BLADE 90	LOADING AZIMUTH				BLADE 270	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			7048365351		40			7403674751	
55			1586653552		55			1503966252	
75			2121839152		75			1835108652	
85			2326036452		85			1665673852	
90			2275965852		90			1529736352	
95			1967764252		95			1407363552	
BLADE 120	LOADING AZIMUTH				BLADE 300	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			8345739551		40			9411255651	
55			1781960052		55			1707589752	
75			2281456252		75			2250289552	
85			2434734652		85			2607101752	
90			2444814052		90			2748269752	
95			1879413552		95			2322676252	
BLADE 150	LOADING AZIMUTH				BLADE 330	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			8447065151		40			1097484852	
55			1710681052		55			1964136952	
75			2171432752		75			2606213152	
85			2638373152		85			2941608652	
90			2631617052		90			2832692952	
95			2171152252		95			2355428652	

		HARMONIC		ANALYSIS		
		40		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	8433701751					70023
1	1851104751	3480728750	1883545451	1064927752		71023
2	1002822251	1025221651	1434131051	1571836053		72023
3	1168084250	4104448350	4267425150	3529527452		73023
4	5368585049	2001803050	2072542550	7125318752		74023
5	2166514750	1152825050	2454137650	4160358252		75023
		55		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	1641682352					80023
1	1856701051	8656135050	2048566651	2499542852		81023
2	1407869051	2113063751	2539120651	1518371553		82023
3	2363033350	3624100050	4326433550	1896477352		83023
4	6717440050	1520733349	6719161150	3242184650		84023
5	4730323350	8976660049	4814744350	3814903352		85023
		75		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2185313752					90023
1	8913673350	8505990050	1232093851	4365933352		91023
2	1237980051	1433111051	1893779951	1554109053		92023
3	8534580050	2014150051	2187515351	8234539852		93023
4	3584650050	5400560050	6481961050	5910640152		94023
5	1042072851	1431103851	1770303351	6121212452		95023
		85		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2491348852					100023
1	1568701351	6174430050	1685840951	2014846753		101023
2	4793621750	5868558350	7577518550	1546215153		102023
3	3301496750	3962580251	3976310051	8841243152		103023
4	2265651751	3828519851	4448678751	5984592352		104023
5	1637665751	4332266749	1638238651	7169693152		105023
		90		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2478681052					110023
1	2727124751	9744506750	2895990951	1996627253		111023
2	3090870050	3483878350	4657347450	1142104153		112023
3	9828740050	4962493851	5058891851	8626565552		113023
4	3109921551	4376390351	5368836451	5865047652		114023
5	2553086751	2568936750	2565978651	7085083952		115023
		95		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2103710352					120023
1	2133520551	1060616351	2382607151	2064329153		121023
2	7876861750	4914046750	9284008050	7402084252		122023
3	1427004051	4314640251	4544499151	8389969552		123023
4	2420286751	4311566851	4944430851	6017311152		124023
5	2658006851	4520185050	2696167851	7006973152		125023



TOTAL		BLADE	THRUST
BLADE	POSITION	THRUST	
	0	3607648954	6023
	30	2565030054	306023
	60	3629456454	606023
	90	2994195854	906023
	120	3255236154	1206023
	150	3288039954	1506023
	180	3258999254	1806023
	210	3015380954	2106023
	240	3022691354	2406023
	270	2562989854	2706023
	300	3403606054	3006023
	330	3834990254	3306023

HARMONIC		ANALYSIS		
COEF	COSINE	SINE	MAX	PSI
STEADY	3203188754			130023
1	1349791253	5492321752	1457255153	2214148652
2	1676141853	2236241553-	2794678453	1534254353
3	6774728352-	2380841853-	2475353953	8470539952
4	9723011752-	2216913353-	2420759053	6157963752
5	1070938353	7740425052-	1321382153	6482834252

PER CENT RADIUS	K	BEAM RED		BENDING BLADE		R E E S		9Q+(120)K
		0+(120)K	D E G 30+(120)K	60+(120)K	90+(120)K	120+(120)K	150+(120)K	
15	0	9742100054-	2442500054-	1643340055-	9437950054-	217223		
	1	1704170055-	6092300054-	1156700055-	1673755055-	218223		
	2	1225900054-	1521680055-	5990000053	6092300054-	219223		
28	0	2274350054-	1965250054	5277400054-	4637250053	227223		
	1	1391100054-	7728250053-	2210000052	4217500054-	228223		
	2	2848500054	1037800054-	1258650054	1037800054-	229223		
36	0	1561000054-	1386500054	4115500054-	1100000052	237223		
	1	2075000053	1561000054-	1091750054	2936500054-	238223		
	2	2074250054	7970000053	7750000053-	1561000054-	239223		
45	0	8964000053-	8424000053	2428200054-	1062000054-	247223		
	1	9252000053	1641600054-	7596000053	8964000053-	248223		
	2	1339200054	2043000054	2221200054-	2386800054-	249223		
60	0	1714200054-	3400800054-	1489320054-	4675120054-	257223		
	1	1676720054-	2576240054-	3625680054	5898000053-	258223		
	2	2613720054-	1471600054	5049920054-	6624080054-	259223		
65	0	1589130054-	4777700054-	1083625054-	3183415054-	267223		
	1	2133520054-	2444600054-	4933240054-	6558900053-	268223		
	2	3611150054-	2143830054	6022020054-	7694075054-	269223		
80	0	1244225054-	5371750054-	1977150054-	7493375054-	277223		
	1	4060200054-	1745700054-	7686250054-	9356250053-	278223		
	2	5718925054-	1648900054	4098775054-	8573475054-	279223		
92.5	0	2200000053-	1360000054-	1170000054-	1835000054-	287223		
	1	1930000054-	6000000053-	3402500054-	4100000053-	288223		
	2	3260000054-	1110000054	1170000054-	3687500054-	289223		

STEADY				STATE		DATA								
WH.	BEAM	BEND	.15R	K	0+(120)K	D	E	G	R	E	F	S	90+(120)K	
				0	1040650055-	1677200055-	2504500054-	1282100055-	717423					
				1	2504500054-	4150750054-	9748000054-	3821500054-	718423					
				2	1413800055-	9089509054-	1490625055-	7662750054-	719423					
WH.	BEAM	BEND	.20R	0	1099100054	3145630054-	2930160054	6612000052-		727423				
				1	1265560054	6612000052-	1564260054-	2680470054	728423					
				2	4310850054-	8494100053	3990400053-	2325800053-	729423					

HARMONIC ANALYSIS				RED BLADE BEAM BENDING			
15	PER CENT	RADIUS	COEF	COSINE	SINE	MAX	PSI
STEADY				9285875054-			290223
1				2570228554	2586834554-	3646613154	3148155153
2				7857227553	1185307854-	1422081154	1517699053
3				1013849353-	1419366754	1422983054	3136189552
4				2205088554-	8341056753-	2357572454	5017995852
5				1556395554-	6895624854	7069088254	2054379552
28	PER CENT	RADIUS	COEF	COSINE	SINE	MAX	PSI
STEADY				7875458353-			360223
1				1506943052	7677666753-	7679145553	2711244453
2				4048225553-	3952070553-	5657472153	1121557053
3				5299498853	8243668053	9800140353	1908826152
4				8096439252	2677210253	2796958753	1829339852
5				1693244054-	2342895554	2890715254	2517123652
36	PER CENT	RADIUS	COEF	COSINE	SINE	MAX	PSI
STEADY				5785000053-			310223
1				4158414053-	5223519053-	6676642753	2314769053
2				3848122753-	1418128352	3850734953	8894473752
3				7532500853	8514999253	1136854354	1616784252
4				6631872753	4396162053	7956630953	8384940051
5				1663783554-	9808513753	1931384254	2989587052
45	PER CENT	RADIUS	COEF	COSINE	SINE	MAX	PSI
STEADY				4686000053-			320223
1				7087362853-	4001336853-	8138882453	2094479353
2				3277497753-	6035333053	6867840653	5925212752
3				8763002253	9314997753	1278903454	1558297852
4				6796499053	5437773353	8704124153	9665689851
5				9955638353-	2208666553-	1019769354	3850170652

		HARMONIC ANALYSIS			
		RED BLADE	BEAM	BENDING	
60	PER CENT	RADIUS			
COEF		COSINE	SINE	MAX	PSI
STEADY		2713666754-			330223
1		8588082553-	2722109753-	9009164353	331223
2		5528293553-	1130642554	1258559854	332223
3		6933801553	1230592854	1412492354	333223
4		5778169053	3732738753	6878995253	334223
5		1121167354	1570555854-	1929679154	335223
65	PER CENT	RADIUS			
COEF		COSINE	SINE	MAX	PSI
STEADY		2998711354-			340223
1		9086912853-	1321710353	9182532453	341223
2		1140625954-	1178639154	1640188254	342223
3		7841810553	1075817754	1331286454	343223
4		1108222854	1796016353	1122681854	344223
5		1796564554	1719975354-	2487158854	345223
80	PER CENT	RADIUS			
COEF		COSINE	SINE	MAX	PSI
STEADY		3936045854-			350223
1		2435330253-	7787623753-	8159529253	351223
2		5786240753-	6458673553	8671507653	352223
3		4564710053	192320354	1975773554	353223
4		2443089853	5122389353	5675170553	354223
5		3008073254	1870054554-	3541978054	355223
92.5	PER CENT	RADIUS			
COEF		COSINE	SINE	MAX	PSI
STEADY		1494583354-			360223
1		1851538053	1207396353-	2210429553	361223
2		3602079553-	1714008253	3989065253	362223
3		5541678352	8470832253	8488939953	363223
4		4077087753	5553385053	6889319953	364223
5		1350679054	5046771753-	1441885254	365223
		HARMONIC ANALYSIS			
WH.	BEAM BEND .15R				
COEF		COSINE	SINE	MAX	PSI
STEADY		9043770854-			750423
1		2549927354-	2060730754	3278527154	751423
2		4298541053	1156396554-	1233704854	752423
3		1829066752	9511681753-	9513440253	753423
4		1472480254-	1378172754-	2016818854	754423
5		2202383354	4877647854-	5351816554	755423
WH.	BEAM BEND .20R				
COEF		COSINE	SINE	MAX	PSI
STEADY		7999166752-			760423
1		4364292852	6611890553	6626278553	761423
2		2288827553-	3403832853-	4168431653	762423
3		4855082553-	7906850553-	9278475753	763423
4		1595245553	3003302253	3400681153	764423
5		1773544854	1909639054-	2606181654	765423

		CHORD RED		BENDING BLADE					
PER	CEN1 RADIUS	K	O+(120)K	D E G 30+(120)K	R E E S 60+(120)K	90+(120)K			
		0	7815500055	3773000055	5929000055	3234000055		67123	
	15	1	2425500055	1078000055	2695000055	4851000055		68123	
		2	3234000055	6602750055	7276500055	7815500055		69123	
		0	6536050055	4062950055	5564475055	2826400055		77123	
	28	1	3091375055	8832500054	3356350055	4681225055		78123	
		2	2738075055	6977675055	6359400055	7949250055		79123	
		0	2579080055	2210640055	2878437555	1105320055		87123	
	60	1	2463942555	1842200054	2901465055	2003392555		88123	
		2	1197430055	3477152555	2164585055	4144950055		89123	
		0	1505120055	1505120055	1787330055	1034770055		97123	
	80	1	1787330055	5644200054	1975470055	1458085055		98123	
		2	1034770055	1951952555	1364015055	2210645055		99123	
WH.	CHORD	BEND	.15R	0	2514820055	5685680055	3717560055	6997760055	737423
				1	8309840055	8091160055	8528520055	4373600055	738423
				2	6669740055	3717560055	2624160055	1749440055	739423
WH.	CHORD	BEND	.28R	0	3095355055	4894980055	3455280055	6334680055	747423
				1	7054530055	7198500055	7198500055	4319100055	748423
				2	5758800055	3599250055	3383295055	1367715055	749423

		HARMONIC		ANALYSIS			
15	PER	CENT	RED BLADE RADIUS	CHORD	BENDING		
COEF			COSINE	SINE	MAX	PSI	
STEADY			4727479255				100123
1			2299128555	1523941255	2758330855	3264622253	101123
2			6833333348	1166970754	1166970754	1349998453	102123
3			4042493254	7411242354	8442053254	8046318552	103123
4			3593334754	3889951753	3614328654	1544618551	104123
5			6653716754	9015579754	1720502755	6128564652	105123
28	PER	CENT	RADIUS				
COEF			COSINE	SINE	MAX	PSI	
STEADY			4585539655				110123
1			1968467555	1395978255	2413217655	3246568853	111123
2			7833333348	1784807254	1784807254	1349998853	112123
3			4857867754	5888326754	7633562154	7682579152	113123
4			3385791754	1529839554	3715372754	6078850851	114123
5			1071697254	1268492255	1273011355	5496584452	115123
60	PER	CENT	RADIUS				
COEF			COSINE	SINE	MAX	PSI	
STEADY			2245181355				120123
1			7161821754	4529576554	8474004554	3276882353	121123
2			1055422054	4320855053	1140444454	1688680153	122123
3			2840054754	2916814354	4071082954	7525463852	123123
4			2705730254	1163309554	2945210554	5816236151	124123
5			5933689754	1024640155	1184049855	4798497552	125123
80	PER	CENT	RADIUS				
COEF			COSINE	SINE	MAX	PSI	
STEADY			1514919055				130123
1			1934464854	1164065054	2257698354	3289625653	131123
2			6271300753	2036675053	6593734453	1710041253	132123
3			1332656354	1136677754	1751513354	7348741352	133123
4			1019091854	7467825053	1263420854	9058417651	134123
5			2953555754	4558525754	5431726154	4741200752	135123

				HARMONIC		ANALYSIS			
WH.	CHORD	BEND	.15R						
COEF				COSINE	SINE	MAX	PSI		
STEADY				5248320055					770423
1				2448071055-	1579064055	2913158955	1471770353		771423
2				6378230053-	4734538353-	7943404253	1082931953		772423
3				4373603854	7289336054	8500754654	1967874452		773423
4				1913456354	1104734754	2209469154	7500001051		774423
5				9961371854-	7899698754	1271354355	2831688452		775423
WH.	CHORD	BEND	.28R						
COEF				COSINE	SINE	MAX	PSI		
STEADY				4804998855					780423
1				1940233855-	1187206855	2274635655	1485380253		781423
2				9598046753-	8312095053-	1269698554	1104466153		782423
3				3119353854	6118728554	6867984154	2099577352		783423
4				2519482754	2701440054	3693991254	1174901052		784423
5				4232719554-	7923810754	8983467654	2362202452		785423

			(120)K	D E G 30*(120)K	R E E 60*(120)K	S 90*(120)K		
R/B	TORS	.15R	0	4942240054-	3088900054-	3088900054-	1235560054-	487323
			1	4324460054-	3706680054-	3088900054-	2471120054-	488323
			2	1853340054-	3088900054-	3088900054-	4324460054-	489323
R/B	TORS	.50R	0	1445520054-	1065120054-	2282400054-	9890400053-	497323
			1	1369440054-	1597680054-	8368800053-	9890400053-	498323
			2	8368800053-	1217280054-	1293360054-	1445520054-	499323

# HARMONIC ANALYSIS

R/B	TORS	.15R					
COEF			COSINE	SINE	MAX	PSI	
STEADY			3191863354-				560323
1			4872278853-	4778593352-	4895656353	1856015053	561323
2			7207426553-	7133509053	1014070854	6764766152	562323
3			3088903253-	3088903253-	4368368853	7499999852	563323
4			1029631753	3166666747-	1029631753	8999999552	564323
5			1305524753-	6655653053	6782485753	2021956652	565323

R/B	TORS	.50R					
COEF			COSINE	SINE	MAX	PSI	
STEADY			1280680054-				570323
1			2045788753-	2006041753-	2865214653	2244379853	571323
2			4438016752	7686843352	8876009952	2999999652	572323
3			1267998753	7608013352-	1478729053	1096787353	573323
4			1584998653	2086427353	2620190753	1319427852	574323
5			2265413053-	2386439253	3290469353	2670193952	575323

		STEADY	STATE	DATA			
				D E G	R E E S		
RED BLADE	PITCH	K	0+(120)K	30+(120)K	60+(120)K	90+(120)K	
		0	1549820552	1404233052	1270292552	1479990552	867523
		1	1252822052	1311057052	1369292052	1543997052	868523
		2	1730349052	1823525052	1811878052	1695408052	869523
RED BLADE	FLAP	0	4788000050-	1276800051-	1064000050	1276800051-	877523
		1	3192000050-	6384000050	1276800051	2128000051	878523
		2	9044000050	1808800051	1064000051	2128000050	879523
VERTICAL	ACCEL	0	1000000051	9330100050	1018270051	9573700050	887523
		1	9939100050	1015225051	1000000051	9391000050	888523
		2	9817300050	9695500050	1018270051	1015225051	889523
FORE- AFT	ACCEL	0	7271000049	1665550050	3966000049-	5288000049	897523
		1	1421150050-	7601500049	9915000049	1817750050	898523
		2	2313500049-	3305000049	1322000050-	6610000049	899523
LATERAL	ACCEL	0	4056000049	6422000049		1690000049-	907523
		1	9802000049-	1014000050	1014000049	6760000048	908523
		2	2704000049-	3042000049-	6760000049-	1365800050	909523

# HARMONIC ANALYSIS

RED BLADE PITCH							
COEF		COSINE	SINE	MAX	PSI		
STEADY		1492556152					910523
1		7364110050	3033599851-	3121702951	2836447153		911523
2		1795598050-	1765153350-	2517923450	1122550753		912523
3		1358835050	2523535050	2866123150	2056636452		913523
4		1989685550-	8407333348	1991460950	4439510852		914523
5		3035183349	9167643349-	9657019349	5766368852		915523

RED BLADE FLAP							
COEF		COSINE	SINE	MAX	PSI		
STEADY		3990000050					920523
1		7967040850-	1077362351-	1339942951	2335172653		921523
2		3989995849	3839379549	5537228649	2194895952		922523
3		3901331550-	1773344549	3905359850	5913247652		923523
4		6649991849-	3839371749-	7678747749	5249999752		924523
5		3090371350	4477043050-	5440065250	6092323952		925523

VERTICAL ACCEL							
COEF		COSINE	SINE	MAX	PSI		
STEADY		9868050050					930523
1		4195991748	7793500047-	4267754948	3494779753		931523
2		3044860048	2461244249-	2480007049	1385261853		932523
3		1014990049-	1015100048	1020053449	5809626552		933523
4		5074923348-	2109628549-	2169811349	6411848152		934523
5		5954196748	4295493348-	7341915348	6483849452		935523

# HARMONIC ANALYSIS

FORE- AFT ACCEL							
COEF		COSINE	SINE	MAX	PSI		
STEADY		3442708349					940523
1		8296746748-	7866928347-	8333960248	1854165653		941523
2		8345123849	6058352749	1031235850	1798935952		942523
3		3304996748-	3855847248-	5078440848	7646627852		943523
4		3002040249	4770358347-	3002419249	8977240952		944523
5		1618257848-	6845882248	7034547748	2065993752		945523

LATERAL ACCEL							
COEF		COSINE	SINE	MAX	PSI		
STEADY		1014000049					950523
1		2351844849	3455478248	2377094349	8358453351		951523
2		5830498549	4390756748-	5847007849	1778466953		952523
3		4506669848-	1126660048	4645367248	5532128352		953523
4		9295025048-	4439534849-	4535795949	6454370852		954523
5		3801788348-	4431209748	5838596848	2612563752		955523

			STEADY	STATE	DATA						
					D	E	G	R	E	E	S
					K						
					0+11201K						
					30+11201K						
					60+11201K						
					90+11201K						
LIFT LINK	LOAD		K		0	1	2				
			0		5156697054	4505026554	4561693554	4590027054			1037623
			1		5326698054	5326698054	5100030054	4533360054			1038623
			2		4646694054	4646694054	5610033054	5326698054			1039623
RT. CYCLIC	LOAD		0		8320000052	2912000053	2288000053	1664000053-			1047623
			1		4160000052	2080000052	8320000052	2288000053			1048623
			2		1456000053	1040000053-		2080000052			1049623
LT. CYCLIC	LOAD		0 <td></td> <td>1353600053-</td> <td>1128000053-</td> <td>6768000052</td> <td>1128000053-</td> <td></td> <td></td> <td>1057623</td>		1353600053-	1128000053-	6768000052	1128000053-			1057623
			1		9024000052	1353600053	9024000052-	9024000052-			1058623
			2		4512600052	9024000052-		2256000052			1059623
COLLECTIVE	LOAD		0 <td></td> <td>3968000052</td> <td>1984000052</td> <td>9920000052</td> <td>1984000052</td> <td></td> <td></td> <td>1067623</td>		3968000052	1984000052	9920000052	1984000052			1067623
			1		3968000052	7936000052	5952000052	6944000052-			1068623
			2		1190400053	1984000052	3968000052	7936000052			1069623
STABILIZER	BAR		0 <td></td> <td>7238000050</td> <td>2585000051</td> <td>3825300051</td> <td>3929200051</td> <td></td> <td></td> <td>1077623</td>		7238000050	2585000051	3825300051	3929200051			1077623
			1		2481600051	9306000050	1240800051-	2946900051-			1078623
			2		4239400051-	4239400051-	2895200051-	1344200051-			1079623

# HARMONIC ANALYSIS

LIFT LINK	LOAD		COSINE	SINE	MAX	PSI	
COEF	STEADY		4944195854				1080623
1			2188283052	6496960052-	6855587552	2886143953	1081623
2			1322222553	4825714553-	5003577953	1426613653	1082623
3			2361076752-	4722833351	2407848652	5622949452	1083623
4			7083331752-	1635885052	7269780552	4174890852	1084623
5			3006286752	4135916752	5113078052	1079752052	1085623

RT. CYCLIC	LOAD		COSINE	SINE	MAX	PSI	
COEF	STEADY		7280000052				1090623
1			1247332752	1281334252	1788199152	4577037952	1091623
2			8493334052	1170866453	1446476953	2702164452	1092623
3			6933344251-	2080000052	2192512852	3614499352	1093623
4			9879998352-	2101555852	1010103553	4199792452	1094623
5			5539981051-	2321331252-	2386523152	5131542852	1095623

LT. CYCLIC	LOAD		COSINE	SINE	MAX	PSI	
COEF	STEADY		2256000052-				1100623
1			3269752552-	2004128252	3835076452	1484946453	1101623
2			2444000852-	4884383552-	5461716052	1217089953	1102623
3			3759990551	1880000052	1917231252	2623003152	1103623
4			8460000352-	5535634752-	1011013653	5329948752	1104623
5			4377531251	1252126352-	1405186652	5939827752	1105623

COLLECTIVE	LOAD		COSINE	SINE	MAX	PSI	
COEF	STEADY		4546666752				1110623
1			7926459051	4576349351	9152689551	3000003452	1111623
2			5786670251-	1002280152-	1157333552	1200000053	1112623
3			2000000045	1488000352	1488000352	2999999852	1113623
4			1074667552-	5011400052-	5125333252	6447413952	1114623
5			1784644852-	1030366252	2060730852	2999999652	1115623

STABILIZER	BAR		COSINE	SINE	MAX	PSI	
COEF	STEADY		2024916750-				1120623
1			1021589251	3952177051	4082076451	7550697452	1121623
2			3015830349-	7462233348	3106780049	8305107052	1122623
3			1206378050-	6031696749-	1348727050	6885502652	1123623
4			4307981748-	7461933348	8616214748	2999976052	1124623
5			8134503349	7180630549	1085041950	8287210151	1125623

			STEADY	STATE	DATA				
					D E G	R E E S			
				K	0+(120)K	30+(120)K	60+(120)K	90+(120)K	
R F	PYLON		0	3540000049-	4277500049	1475000049	6785000049	447323	
			1	2950000048	8850000048	2065000049-	5605000049	448323	
			2	2065000049	5752500049	5900000048-	1770000049-	449323	
R A	PYLON		0	1230000050	1605000050	1725000050	1260000050	457323	
			1	1005000050	1095000050	1410000050	1725000050	458323	
			2	1635000050	1200000050	8400000049	8400000049	459323	
L F	PYLON		0	1050000049	4200000049-	3300000049-	4200000049-	467323	
			1	1800000049	2100000049	6000000048-	5400000049-	468323	
			2	2700000049-	3000000049-	3300000049	4200000049	469323	
L A	PYLON		0	1921500050	7777500049	1342000050	4422500049	477323	
			1	1357250050	1342000050	1723250050	7320000049	478323	
			2	1235250050	5185000049	1357250050	1555500050	479323	
					HARMONIC	ANALYSIS			
R F			PYLON						
COEF				COSINE	SINE	MAX	PSI		
STEADY				1597916749				520323	
1				9435745348-	3252881348	9980707748	1609788753	521323	
2				2544375049-	2107689549	3303967249	7018130352	522323	
3				6016666742	4916660047	4916660047	2999976752	523323	
4				1352088148	1000620349	1009714049	2057612952	524323	
5				2060750548	2401293248	3164317048	9872869651	525323	
R A			PYLON						
COEF				COSINE	SINE	MAX	PSI		
STEADY				1297500050				530323	
1				9037663348-	5805622848	1074172349	1472840953	531323	
2				3499991048	4200223749	4214780949	4261831152	532323	
3				1749987548-	1250008848	2150576348	4815398052	533323	
4				2249990848-	1732040548-	2839440648	5439726152	534323	
5				1787687748	1555601248-	2369751548	6379420452	535323	
L F			PYLON						
COEF				COSINE	SINE	MAX	PSI		
STEADY				9125000048-				540323	
1				8263142748	5781090548-	1008466849	3250244553	541323	
2				1074999349	3897114549-	4042663149	1427106353	542323	
3				1249996848	5000035047	1346289548	7267199651	543323	
4				7750003748-	6928202848-	1039531449	5544887152	544323	
5				1263145548-	2810865047	1294042648	3349088952	545323	
L A			PYLON						
COEF				COSINE	SINE	MAX	PSI		
STEADY				1192041750				550323	
1				7935703348	1127933248-	8015461348	3519105153	551323	
2				3736248349	2201147849-	4336427449	1647481353	552323	
3				1525005048	1524985048-	2156668648	1050001353	553323	
4				4066660048-	1804940049-	1850185349	6432572052	554323	
5				4518166747	4209553248-	4233730748	5522523552	555323	
				K	D E G		R E E S		
					(120)K	30+(120)K	60+(120)K	90+(120)K	
RED	PITCH LINK		0	2506500053-	2228000053-	2785000053-	1392500053	507323	
			1	8355000052-	2228000053-	2785000052-	2228000053	508323	
			2	2785000052-	1114000053-	1671000053-	1671000053-	509323	
WHITE	PITCH LINK		0	5832000052	1749600053	2916000052-	2041200053-	517323	
			1	5832000052-	1166400053-	2624400053-	1749600053-	518323	
			2	3207600053-	5832000052-	5832000052-	1458000053-	519323	
					HARMONIC	ANALYSIS			
RED			PITCH LINK						
COEF				COSINE	SINE	MAX	PSI		
STEADY				9979583352-				580323	
1				1212605753-	2411881052-	1236359353	1912493653	581323	
2				3713332852-	4823762752	6087489452	6379454252	582323	
3				1856665552	1253250253-	1266928653	9280898852	583323	
4				3713332052	6431681852	7426665952	1500000352	584323	
5				8706091751-	2411879352	2564200152	2196958452	585323	
WHITE			PITCH LINK						
COEF				COSINE	SINE	MAX	PSI		
STEADY				9963000052-				590323	
1				1240577453	4937881252	1335237453	2170408352	591323	
2				2673002252	4208881751	2705935652	4474132651	592323	
3				4859993851	8747999352	8761488952	2894005852	593323	
4				1700997252-	7155100052	7354512152	2584320352	594323	
5				3146223752	3479882752-	4691301352	6242346052	595323	



IBM TAB NO. 2  
TYPE I STEADY STATE CONDITION NO. 27  
LEVEL FLIGHT, TRUE AIRSPEED 34 KNOTS

PER CENT CHORD	K	40		DELTA PER CENT	PRESSURE RADIUS	
		0+11201K	D E G 30+11201K	R E E S 60+11201K	90+11201K	
4	0	2561570051	2807200051	2807200051	2649295051	17127
	1	2579115051	2175580051	1772045051	1263240051	18127
	2	1438690051	1579050051	1754500051	2315940051	19127
17	0	1272600051	1372590051	1290780051	1254420051	27127
	1	1254420051	1127160051	1018080051	6999300050	28127
	2	6726600050	7453800050	8726400050	1199880051	29127
34	0	5240000050	6840000050	6720000050	6120000050	37127
	1	5880000050	5400000050	5400000050	3660000050	38127
	2	3840000050	3720000050	4200000050	5520000050	39127
63	0	2765700050	3029100050	2831550050	2809600050	47127
	1	2674000050	2502300050	2699850050	2041350050	48127
	2	1887700050	1887700050	1843800050	2634000050	49127
88	0	1205100050	1174200050	1019700050	1127850050	57127
	1	1081500050	1143300050	1421400050	1004250050	58127
	2	8497500049	8034000049	7725000049	1035150050	59127

PER CENT CHORD	K	55		DELTA PER CENT	PRESSURE RADIUS	
		0+11201K	D E G 30+11201K	R E E S 60+11201K	90+11201K	
2	0	5022720051	5068800051	4746240051	4377600051	147227
	1	2903040051	4608000051	4239360051	3824640051	148227
	2	3778560051	3363840051	3640320051	4654080051	149227
9	0	2908800051	3067875051	2817900051	2727000051	157227
	1	2090700051	2772450051	2499750051	2227050051	158227
	2	2227050051	1999800051	2181600051	2772450051	159227
17	0	2175580051	2280850051	2245760051	2052765051	167227
	1	1754500051	2105400051	1929950051	1719410051	168227
	2	1719410051	1543960051	1649230051	2035220051	169227
23	0	1706880051	1813560051	1671320051	1564640051	177227
	1	1457960051	1671320051	1564640051	1351280051	178227
	2	1315720051	1209040051	1315720051	1635760051	179227
34	0	1584000051	1663200051	1636800051	1544400051	187227
	1	1452000051	1557600051	1478400051	1320000051	188227
	2	1313400051	1214400051	1267200051	1504800051	189227
63	0	5087500050	5128200050	4782250050	4497350050	197227
	1	4477000050	4965400050	4639800050	4008950050	198227
	2	4070000050	3622300050	3703700050	4782250050	199227
90	0	1949100050	2055900050	1975800050	2055900050	207227
	1	2055500050	2136000050	2042550050	1708800050	208227
	2	1655400050	1468500050	1495200050	1922400050	209227

PER CENT CHORD	K	75		DELTA PER CENT	PRESSURE RADIUS	
		0+11201K	D E G 30+11201K	R E E S 60+11201K	90+11201K	
2	0	6933990051	6367950051	5849080051	5283040051	377327
	1	5731155051	6745310051	7500030051	7311350051	378327
	2	5047190051	5424550051	5613230051	6650970051	379327
9	0	4194630051	4279370051	4067520051	3813300051	387321
	1	4067520051	4258185051	4575960051	4364110051	388321
	2	3220120051	3156565051	3220120051	3982780051	389321
17	0	2613720051	2358030051	2130750051	1832445051	397321
	1	2116545051	2443260051	2812590051	2698950051	398321
	2	2017110051	2045520051	2045520051	2500080051	399321
23	0	2694640051	2513270051	2331900051	2176440051	407327
	1	2357810051	2565090051	2772370051	2591000051	408327
	2	2046890051	2046890051	2072800051	2539180051	409327
34	0	1619370051	1505730051	1363680051	1250040051	417327
	1	1406295051	1590960051	1761420051	1619370051	418327
	2	1250040051	1221630051	1250040051	1534140051	419327
63	0	7563800050	6986900050	6057450050	6025400050	427327
	1	6858700050	7179200050	7563800050	7243300050	428327
	2	6922800050	6025400050	6025400050	7083050050	429327
90	0	3621000050	3532250050	3443500050	3656500050	437327
	1	3763000050	4047000050	3869500050	3479000050	438327
	2	3727500050	3053000050	3266000050	3514500050	439327

PER CENT CHORD	X	R5		DELTA PER CENT		PRESSURE RADIUS	
		0+11201K	10+11201K	D L G	R L F S	90+11201K	
2	0	7801060051	6190230051	5394350051	7054150051	607427	
	1	7054150051	6556210051	7469100051	7718070051	608427	
	2	9460860051	5892270051	6307240051	8050030051	609427	
4	0	7511205051	6044520051	4977840051	6711195051	617427	
	1	6933420051	6400080051	7022310051	7022310051	618427	
	2	8533440051	5244510051	5600070051	7200090051	619427	
9	0	5273730051	4657320051	4169400051	5273730051	627427	
	1	5205240051	4725810051	5068260051	4794300051	628427	
	2	5616180051	3629970051	3835440051	4965525051	629427	
13	0	3750300051	3194700051	2708550051	4792050051	637427	
	1	3657700051	3379900051	3657700051	3518800051	638427	
	2	4213300051	2731700051	2824300051	3680850051	639427	
17	0	3431400051	2941200051	2745120051	3677480051	647427	
	1	3431400051	3333360051	3431400051	3235320051	648427	
	2	3529440051	2205900051	2352960051	3235320051	649427	
23	0	2850900051	2478090051	2280720051	2938620051	657427	
	1	2708355051	2587740051	2741250051	2730285051	658427	
	2	3026340051	2171070051	2258790051	2785110051	659427	
34	0	1862525051	1556450051	1284500051	1853350051	667427	
	1	1724900051	1761600051	1835900051	1871700051	668427	
	2	2073550051	1486350051	1523050051	1853350051	669427	
47.7	0					677427	
	1					678427	
	2					679427	
63	0	6711600050	5426400050	3712800050	5712000050	687427	
	1	5331200050	5807200050	6664000050	6902000050	688427	
	2	8282400050	6378400050	5997600050	7092400050	689427	
77	0	2559800050	1327200050	2844000049-	1327200050	697427	
	1	1279800050	1990800050	2559600050	2938800050	698427	
	2	3792000050	2844000050	2464800050	2938800050	699427	
90	0	9430000048-	8487000049-	1886000050-	1320200050-	707427	
	1	1084450050-	5658000049-	1414500049-	9430000048	708427	
	2	7544000049	2829000049		2829000049	709427	

PER	CFNT	K	90		DELTA		PRESSURE	
			PER	CENT	PER	CENT	RADIUS	
CHORD			O+11201K	D E G	R F F S		90+11201K	
		0	8148140051	6349200051	4867720051	6455020051	797527	
	2	1	6666660051	6243380051	7301580051	7619040051	798527	
		2	9100520051	7777770051	6455020051	8465600051	799527	
		0	4977180051	3871140051	3041610051	4424160051	807527	
	9	1	4424160051	3871140051	4424160051	4424160051	808527	
		2	4608500051	3871140051	3594630051	4700670051	809527	
		0	4023560051	3431860051	2840160051	4851940051	817527	
	17	1	3668540051	3550200051	3905220051	3786880051	818527	
		2	4615260051	3846050051	3195180051	4260240051	819527	
		0	2843160051	2500020051	2254920051	3235320051	827527	
	23	1	2647080051	2529600051	2500020051	2500020051	828527	
		2	2941200051	2475510051	2156880051	2892180051	829527	
		0	1592720051	1259360051	9260000050	1592720051	837527	
	34	1	1389000051	1259360051	1407520051	1481600051	838527	
		2	1814960051	1518640051	1222320051	1629760051	839527	
		0	5431800050	4279600050	2304400050	4938000050	847527	
	63	1	4279600050	4773400050	5267200050	5925600050	848527	
		2	7571600050	5514100050	5267200050	6419400050	849527	
		0	3982500049	8850000049	1593000050	7080000049	857527	
	90	1	7965000049	1150500050	5310000049	6195000049	858527	
		2	1150500050	1150500050	3550000049	2655000049	859527	

PER	CFNT	K	95		DELTA		PRESSURE	
			PER	CENT	PER	CENT	RADIUS	
CHORD			O+11201K	D E G	R F F S		90+11201K	
		0	6297825051	4519050051	2163375051	6538200051	967627	
	2	1	4326750051	4326750051	5384400051	5576700051	968627	
		2	6730500051	9903450051	4711350051	6876650051	969627	
		0	4832345051	3827600051	2105180051	5454330051	977627	
	9	1	3636220051	3636220051	4306050051	4306050051	978627	
		2	4975880051	5932780051	3349150051	5071570051	979627	
		0	3368320051	2947280051	1789420051	5578780051	987627	
	17	1	2947280051	2736760051	3052540051	2947260051	988627	
		2	3368320051	4210400051	2526240051	3473580051	989627	
		0	2768200051	1907350051	1134100051	3814700051	997627	
	23	1	1855800051	1855800051	2062000051	2062000051	998627	
		2	2371300051	2938350051	1598050051	2371300051	999627	
		0					1007627	
	34	1					1008627	
		2					1009627	
		0	4683300050	3634800050	1677600050	4054200050	1017627	
	63	1	4054200050	4753200050	5312400050	5452200050	1018627	
		2	6850200050	7339500050	4054200050	5382300050	1019627	
		0	1087500049	3045000049	4350000049	8047500049	1027627	
	90	1	4350000048	4350000049	4785000049	6742500049	1028627	
		2	7830000049	3045000049	1740000049	2175000049	1029627	

		40	BLADE PER CENT	LOADING RADIUS		
			D E G	R F E S		
K		0+(120)K	30+(120)K	60+(120)K	90+(120)K	
0	9703208651	1055140952	1023209152	9765218651	17027	
1	9471087051	8465503751	7894383951	5584969251	18027	
2	5733912051	5998137551	6578376051	8859200051	19027	
		55	BLADE PER CENT	LOADING RADIUS		
			D E G	R F E S		
K		0+(120)K	30+(120)K	60+(120)K	90+(120)K	
0	1878673152	1951345152	1857569152	1750738552	27027	
1	1501579852	1815043852	1684663452	1492426952	28027	
2	1486362852	1343336452	1425307252	1774822752	29027	
		75	BLADE PER CENT	LOADING RADIUS		
			D E G	R F E S		
K		0+(120)K	30+(120)K	60+(120)K	90+(120)K	
0	2468947152	2331550452	2137806952	1991816352	37027	
1	2193273552	2420011252	2634873352	2497902652	38027	
2	1964492952	1910342452	1947832152	2346044152	39027	
		85	BLADE PER CENT	LOADING RADIUS		
			D E G	R F E S		
K		0+(120)K	30+(120)K	60+(120)K	90+(120)K	
0	2730440452	2272839552	1863189552	2665273252	47027	
1	2508087252	2440981252	2646258952	2641858252	48027	
2	3085180552	2072943552	2132546752	2697553852	49027	
		90	BLADE PER CENT	LOADING RADIUS		
			D E G	R F E S		
K		0+(120)K	30+(120)K	60+(120)K	90+(120)K	
0	2588338452	2061342052	1547867152	2502015052	57027	
1	2232392352	2111534952	2390229652	2455387252	58027	
2	2909640652	2411071452	2059037452	2689223152	59027	
		95	BLADE PER CENT	LOADING RADIUS		
			D E G	R F E S		
K		0+(120)K	30+(120)K	60+(120)K	90+(120)K	
0	2143768852	1702706952	9192505851	2697114552	67027	
1	1698288652	1734098752	2001033252	2016783252	68027	
2	2381908752	2928426352	1596957852	2291400652	69027	

BLADE 0	LOADING AZIMUTH	THRUST	PER	INCH
SPAN				
40			9703208651	
55			1878673152	
75			2468947152	
85			2730440452	
90			2588338452	
95			2143768852	

BLADE 30	LOADING AZIMUTH	THRUST	PER	INCH
SPAN				
40			1055140952	
55			1951345152	
75			2331550452	
85			2272839552	
90			2061392052	
95			1702706952	

BLADE 60	LOADING AZIMUTH	THRUST	PER	INCH
SPAN				
40			1023209152	
55			1857589152	
75			2137806952	
85			1863189552	
90			1547867152	
95			9192505851	

BLADE 90	LOADING AZIMUTH	THRUST	PER	INCH
SPAN				
40			9765218651	
55			1750738552	
75			1991816352	
85			2665273252	
90			2502015052	
95			2697114552	

BLADE 120	LOADING AZIMUTH	THRUST	PER	INCH
SPAN				
40			9471087051	
55			1501579852	
75			2193273552	
85			2508087252	
90			2232192352	
95			1698288652	

BLADE 150	LOADING AZIMUTH	THRUST	PER	INCH
SPAN				
40			8465503751	
55			1815046852	
75			2420011252	
85			2440981252	
90			2111534952	
95			1734098752	

BLADE 180	LOADING AZIMUTH	THRUST	PER	INCH
SPAN				
40			7894383951	
55			1684663452	
75			2634873352	
85			2646258952	
90			2390229652	
95			2001033252	

BLADE 210	LOADING AZIMUTH	THRUST	PER	INCH
SPAN				
40			5584969251	
55			1492426952	
75			2497902652	
85			2641858252	
90			2455387252	
95			2016783252	

BLADE 240	LOADING AZIMUTH	THRUST	PER	INCH
SPAN				
40			5733912051	
55			1486362852	
75			1964492952	
85			3085180552	
90			2909640652	
95			2381908752	

BLADE 270	LOADING AZIMUTH	THRUST	PER	INCH
SPAN				
40			5998137551	
55			1343336452	
75			1910342452	
85			2072943552	
90			2411071452	
95			2928426352	

BLADE 300	LOADING AZIMUTH	THRUST	PER	INCH
SPAN				
40			6578376051	
55			1425307252	
75			1947832152	
85			2132546752	
90			2059037452	
95			1596957852	

BLADE 330	LOADING AZIMUTH	THRUST	PER	INCH
SPAN				
40			8859200051	
55			1774822752	
75			2346044152	
85			2697553852	
90			2689223152	
95			2291400652	

		HARMONIC		ANALYSIS		
		40		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	8236458251					70027
1	1208929251	2075693051	2402084851	5978253752		71027
2	4261728850	1815663750	4640257950	1683484553		72027
3	3389348349	1342776850	1384892250	2527799552		73027
4	1037796850	1594729850	1902678550	7576368252		74027
5	3384077550	5787385049	4433208350	3794094752		75027
		55		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	1663490752					80027
1	1173477251	1740866351	2099443851	5601701352		81027
2	1417769451	3911080050	1470726251	7711065551		82027
3	1682386750	1529018350	2271394450	4591140852		83027
4	8619750048	8128533350	8128990350	6765188952		84027
5	3518550049	4490471750	4504235650	1889606252		85027
		75		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2237074352					90027
1	6835206750	6632260050	9524018350	1358633553		91027
2	3129518251	3549566749	3129719551	3249166050		92027
3	1563293350	2897630050	3292437750	8055093452		93027
4	1442053350	1475203350	2062945150	1141276252		94027
5	1022500049	5456183350	5457141350	5421472252		95027
		85		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2479762852					100027
1	1353276351	7558530050	1550055051	2091849253		101027
2	1450991351	1210980050	1456035951	2385390651		102027
3	2802857251	2029866251	3460688551	1080291553		103027
4	4896633350	7672573350	9101944850	7563650352		104027
5	1028666251	1687637051	1976429351	2427271852		105027
		90		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2329844152					110027
1	6839550050	2373495051	2470075551	2539249453		111027
2	5829655050	1701746750	6072958050	1718634253		112027
3	2888731251	1771042851	3388415751	1094960353		113027
4	1430695351	6495983350	1571262951	8389496852		114027
5	1214225551	1057171851	1609955251	2779107552		115027
		95		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2009311552					120027
1	7143660050	3076572551	3158420051	2569278353		121027
2	1510748251	4331513350	1571617151	9799914952		122027
3	2844543851	1066775751	3037999351	1131475653		123027
4	4332741851	4502181750	4356070251	8851691552		124027
5	1416493851	8592391750	1653623851	2978738552		125027

	TOTAL	BLADE	THRUST
BLADE POSITION			THRUST
0		3565273054	6027
30		3377598154	306027
60		2988682254	606027
90		3370851254	906027
120		3121029854	1206027
150		3270472254	1506027
180		3373428654	1806027
210		3104663354	2106027
240		3095471154	2406027
270		2831182554	2706027
300		2708700454	3006027
330		3445522554	3306027

# HARMONIC ANALYSIS

Coeff	COSINE	SINE	MAX	PSI	
STEADY	1187739754				130027
1	5337531752	1422030753	1518902053	6942658652	131027
2	2296085353	2986316751	2296279353	3722527750	132027
3	1184940853	7363041752	1395072953	1093812753	133027
4	9744440052	7045901752	1202492653	8103262052	134027
5	7594628352	5400098352	9318768752	2891711752	135027



PER	CFNT RADIUS	K	BEAM		BENDING		R I F S	90+11201K	
			RFD	HLADT	D F G	HLADT			
			0+11201K		30+11201K		60+11201K		
15		0	7917200054-		7308900054-		1035040055-		217227
		1	1521680055-		1278460055-		1035040055-		218227
		2	1217530055-		6042700054-		7917200054-		219227
28		0	8611500053-		5078500053-		1545500053-		227227
		1	2274350054-		1037800054-		3317000053-		228227
		2	8611500053-		9053500053-		1788600054-		229227
36		0	1168000054-		5785000053-		2075000053-		237227
		1	1364700054-		1855000053-		2075000053-		238227
		2	1100000052		9935000053-		2565500054-		239227
45		0	1890000054-		5652000053-		1800000053-		247227
		1	1558800054-		4770000052		1512000053-		248227
		2	3456000053		1173600054		2664000054		249227
60		0	5424720054-		2763640054-		2388840054-		257227
		1	4037960054-		2701440054-		2613720054-		258227
		2	2501280054-		4024000053-		2150000053-		259227
65		0	6644180054-		2988990054-		2911220054-		267227
		1	4583275054-		2755680054-		3227500054-		268227
		2	2988990054-		3448100053-		1083625054-		269227
80		0	7609100054-		2980100054-		3481575054-		277227
		1	5053150054-		4753075054-		4561675054-		278227
		2	4445950054-		3184750053-		3558725054-		279227
92.5		0	3307500054-		8850000053-		9800000053-		287227
		1	1970000054-		1645000054-		1550000054-		288227
		2	2310000054-		4450000053		1930000054-		289227

WH.	BEAM	BEND	.15R	K	BEAM		BENDING		90+11201K	
					RFD	HLADT	D F G	HLADT		
					0+11201K		30+11201K		60+11201K	
WH.	BEAM	BEND	.15R	0	1018700055-		1238200055-		1260150055-	717427
				1	9528500054-		5138500054-		d211500054-	718427
				2	9967500054-		1062600055-		1336475055-	719427
WH.	BEAM	BEND	.20R	0	3500300053		7319600053-		3990400053-	727427
				1	1764540054		3990400053-		7319600053-	728427
				2	2668000053		1897180054-		1397800054-	729427
					HARMONIC		ANALYSIS			

15	PER	CFNT	RFD	BLADE RADIUS	BEAM COSINE	BENDING SINE	MAX	PSI	
COFF				9691408354-					290227
STEADY				3097520554	2006806054-	3690786454	3270618153		291227
1				6589928553	2634020253-	7046845853	1691066153		292227
2				1115217354-	833333347-	1115217354	6006001552		293227
3				8617566253	4390035753-	9671342253	8325110152		294227
4				7657066553-	4263955553-	8764244653	4182238552		295227

28	PER	CFNT	RADIUS	COSINE	SINE	MAX	PSI	
COFF				6256166753-				300227
STEADY				4621207553	9849558753-	1087976954	2951349953	301227
1				1324872153-	7649180052-	1529831953	1050000553	302227
2				8832499053-	5888335253	1061534454	4876997552	303227
3				1472062552-	7649162352	7789521952	2522331452	304227
4				1561536953	1606109052-	1569775053	1082550852	305227

36	PER	CFNT	RADIUS	COSINE	SINE	MAX	PSI	
COFF				4111250053-				310227
STEADY				1406361753-	1013759554-	1023468054	2621019253	311227
1				2619995553-	6666666746-	2619995553	9000001152	312227
2				916999053-	1015250354	1368072454	4402971752	313227
3				2947494753-	2836232353	4090469353	3402551952	314227
4				3698857853	6400910052	3753813453	1963571651	315227

45	PER	CFNT	RADIUS	COSINE	SINE	MAX	PSI	
COFF				5307000053-				320227
STEADY				3341370053-	1157811154-	1205061854	2539022053	321227
1				4208994853-	1075602853	4344255753	8283247552	322227
2				9659998853-	1228200354	1562572254	4272854752	323227
3				5312993853-	2748763853	5981939953	1816112152	324227
4				4307366753	1090108353	4443168253	2840442551	325227

		HARMONIC		ANALYSIS	
		REF. BLADE	BEAM	BENDING	
		RADIUS			
60	PER CENT	COSINE	SINE	MAX	PSI
COEF		2866710054-			330227
STEADY		1839898753-	1063411254-	1130615654	2501457353
1		7433526353-	1081963352-	7434313653	9041695252
2		1124400154-	1080071354	1559528954	4537867852
3		4122797553-	1731124053	4471492953	3930573252
4		1028890553	7723900051	1031785653	8586304350
5					335227
		RADIUS			
65	PER CENT	COSINE	SINE	MAX	PSI
COEF		1381080454-			340227
STEADY		4630223753-	1012372854-	1112233354	2454223853
1		1004528454-	8980098352	1008534354	8744578252
2		1166550054-	1160069154	1645174554	4505320252
3		3564456553-	1571515053	3895511453	3905201252
4		8136858352-	2456101752-	8499464652	3935927852
5					345227
		RADIUS			
80	PER CENT	COSINE	SINE	MAX	PSI
COEF		4134135454-			350227
STEADY		7076233351-	6662187053-	6662562853	2693914653
1		1160463954-	1726027553	1173229854	8577005252
2		9193708753-	9643746353	1332389354	4454381252
3		1382273553-	2783953352-	1410029853	4784681552
4		5972666053-	5103193553-	7855910153	4410228152
5					355227
		RADIUS			
92.5	PER CENT	COSINE	SINE	MAX	PSI
COEF		1581666754-			360227
STEADY		5181860052-	1444895753-	1535005053	2502705453
1		4472914753-	1714008253	4790072053	7951665952
2		5145832853-	4670831353	6749551153	4592341052
3		1979156852	6855866751	2094538352	4776565151
4		3123486753-	5284273353-	6138380353	4788260952
5					365227
		RADIUS			
		HARMONIC		ANALYSIS	
WH.	BEAM	BEND	.15R		
COEF		COSINE	SINE	MAX	PSI
STEADY		9830312554-			750427
1		2516323054-	9790839553	2700090154	1587393353
2		5396051553	3960261753-	6693358353	1618621953
3		7499571753	3658346753-	8344284153	1113321853
4		9054366353	4910738353-	1030033554	8288157752
5		7786135053	6305816253	1001934254	7800647451
		RADIUS			
WH.	BEAM	BEND	.20R		
COEF		COSINE	SINE	MAX	PSI
STEADY		1840291753-			760427
1		2588487753-	8181615053	8581322353	1075562653
2		9710180252-	4805274752-	1083412553	1031647153
3		8184281353	6658401553-	1055067654	1069565353
4		6935844052-	9610573252	1185196453	3145439252
5		1858416352-	9736855352	9912621352	2016115052

				CHORD	BENDING				
				RED	BLADE				
PER CENT									
RADIUS				K	0+11201K	D E G	R E E S	90+11201K	
	15			0	7815500055	6468000055	4851000055	5390000055	67127
				1	4312000055	2964500055	2156000055	4581500055	68127
				2	5390000055	5390000055	5929000055	8354500055	69127
	28			0	7066000055	6182750055	4239600055	5652800055	77127
				1	4062950055	3356350055	1943150055	4946200055	78127
				2	4592900055	4946200055	5652800055	7595950055	79127
60			0	3292932555	3039630055	1865227555	2901465055	87127	
			1	1727062555	2118530055	9671550054	3062657555	88127	
			2	1888255055	2302756055	2486970055	3500180055	89127	
80			0	1975470055	1975470055	1528637555	1881400055	97127	
			1	1481602555	1740295055	1175875055	2116575055	98127	
			2	1505120055	1740295055	1740295055	2140092555	99127	
WH.	CHORD	BEND	.15R	0	1968120055	4313600055	5029640055	5467000055	737427
				1	6123040055	8528520055	7653800055	6341720055	738427
				2	4810960055	5685880055	4373600055	2624160055	739427
WH.	CHORD	BEND	.28R	0	2015580055	4751010055	4391085055	5038950055	747427
				1	5470860055	7630410055	6766590055	5974755055	748427
				2	3959175055	5614830055	4175130055	3167340055	749427
HARMONIC ANALYSIS									
COEFF STEADY	15	PER	CENT	RED BLADE RADIUS	CHORD	BENDING			
				COSINE	SINE	MAX	PSI		
				5300166755					100127
				2083355755	6031495854-	2168907755	3438538153		101127
				2245751753	3889901753-	4491629553	1499995453		102127
				7635838354	5839160554-	9612586654	1075315653		103127
COEFF STEADY	28	PER	CENT	RADIUS	SINE	MAX	PSI		
				COSINE					
				5019804255					110127
				1747268255	4129565854-	1795405055	3467024953		111127
				2944088353	1019889254-	1061532254	1430508653		112127
				6477171854	6182744054-	8954332954	1054440953		113127
COEFF STEADY	60	PER	CENT	RADIUS	SINE	MAX	PSI		
				COSINE					
				2429401355					120127
				6451365254	1302772854-	6581590254	3485833753		121127
				1554351754	3323700052	1554707054	6124900050		122127
				2648164854	3338984854-	4261642454	1028060453		123127
COEFF STEADY	80	PER	CENT	RADIUS	SINE	MAX	PSI		
				COSINE					
				1750094055					130127
				1941223854	5550208353-	2019009154	3440440953		131127
				6467286753	3394433352	6476188653	1502240651		132127
				8623101753	1136677354-	1426749554	1023949453		133127
COEFF STEADY				RADIUS	SINE	MAX	PSI		
				COSINE					
				5683385053-	5770598353	8099424153	3364093852		134127
				1194445754	1238701751	1200851554	1184140651		135127
				HARMONIC ANALYSIS					
				WH.	CHORD	BEND	.15R	COEFF STEADY	COSINE
				1	5248320055				770427
				2	2211471355-	5756475554	2285164255	1654096553	771427
				3	1275639854-	1578186154-	2029268154	1155257953	772427
				4	6924860754-	6924871254	9793239454	4499998752	773427
				5	5466915053-	3156410053	6312692353	3749983352	774427
					6111903353	7499800052	6157145753	1399136751	775427
WH.	CHORD	BEND	.28R	COEFF STEADY	COSINE	SINE	MAX	PSI	
				1	4912976355				780427
				2	1684641055-	4233277554	1737015255	1658944053	781427
				3	1799691753-	1974126154-	1982312754	1323955553	782427
				4	6478644254-	6358679154	9077754854	4517647352	783427
				5	5398803353-	1766327254	1846992954	2674896252	784427
					4299806753-	7539948353-	8679813253	4806103852	785427

		D E G R E E S					
		120IK	30+(120)K	60+(120)K	90+(120)K		
R/B	TORS	.15R	0	4324460054-	3088900054-	4324460054-	2471120054-
			1	2471120054-	3088900054-	4324460054-	1853340054-
			2	1853340054-	1853340054-	3706680054-	2471120054-
R/B	TORS	.50R	0	1331400054-	1293360054-	1825920054-	1825920054-
			1	9890400053-	1141200054-	1521600054-	8368800053-
			2	7608000053-	1065120054-	1141200054-	1293360054-

# HARMONIC ANALYSIS

R/B	TORS	.15R					
COFF			COSINE	SINE	MAX	PSI	
STEADY			2985936754-				560327
1			3980589353-	4357461853-	5901911953	2275879653	561327
2			5662981053-	8916895052	5732753653	8552585852	562327
3			6177798053	2059270553-	6511972353	1138550153	563327
4			2574088053-	891688152	2724157653	4022336752	564327
5			2197216353-	7907053352-	2335160553	3995842552	565327

R/B	TORS	.50R					
COFF			COSINE	SINE	MAX	PSI	
STEADY			1252150054-				570327
1			1575896853-	2839345553-	3247357753	2609688053	571327
2			1902013552	2196236752-	2905359052	1554468353	572327
3			2345798853	7607988352	2466087453	5989707751	573327
4			1838601053-	1096119353	2141569453	3728797552	574327
5			1810943352	2038560252-	2726764352	6232322152	575327

		STEADY	STATE	DATA			
				D E G	R E E S		
		K	O+11201K	30+11201K	60+11201K	90+11201K	
RED BLADE	PITCH	0	1613879052	1532350052	1404233052	1334351052	867527
		1	1252822052	1334351052	1392586052	1474115052	868527
		2	1602232052	1741996052	1776937052	1724525552	869527
RED BLADE	FLAP	0	1276800051-	1702400051-	1596000051-	3192000050	877527
		1	1170400051	1702400051	2021600051	2766400051	878527
		2	2713200051	9576000050	1064000050-	6384000050-	879527
VERTICAL	ACCEL	0	1000000051	1042630051	9756400050	1039585051	887527
		1	1003045051	9634600050	9878200050	1048720051	888527
		2	9756400050	1030450051	1012180051	9908650050	889527
FORE- AFT	ACCEL	0	5618500049-	3966000049-	6610000049	3966000049-	897527
		1	5288000049-	5949000049-	5288000049-	5288000049-	898527
		2	3966000049	3305000049-	5288000049-	7271000049-	899527
LATERAL	ACCEL	0	1284400050	2028000049	5408000049	3380000048-	907527
		1	4732000049-	3380000049	1216800050		908527
		2	3380000049	6760000048-	3380000049-	6084000049	909527

# HARMONIC ANALYSIS

RED BLADE PITCH		COSINE	SINE	MAX	PSI	
COEF		1515364852				910527
STEADY		1287808051	1998304851-	2377324451	3027997753	911527
1		9220725049-	1092715050-	1429770550	1149205653	912527
2		1747031750-	1261776750	2159040650	4805389052	913527
3		5338316749	4202583149-	6794065949	8044711452	914527
4		6635833348-	8625765049	8651252249	1887982552	915527
5						

RED BLADE FLAP		COSINE	SINE	MAX	PSI	
COEF		5275666750				920527
STEADY		1998114751-	7214223550-	2124361751	1998522053	921527
1		9310014249-	7678900048	9341628349	8764246152	922527
2		3812667750	2482666850-	4549732850	1089764453	923527
3		2216665249-	7678605048-	2345893149	4977656752	924527
4		3235182549-	1539558250	1573182650	2037346152	925527
5						

VERTICAL ACCEL		COSINE	SINE	MAX	PSI	
COEF		1005836351				930527
STEADY		5867811748	2587166748-	6412850148	3362069253	931527
1		7105136748-	1054820549	1271800349	6198185952	932527
2		5076000047	7104893348-	7123002748	9136216152	933527
3		8627568346	2900763349	3026347249	1835906352	934527
4		2851150047-	4981333346	2894338147	3401794252	935527
5						

# HARMONIC ANALYSIS

FORE- AFT ACCEL		COSINE	SINE	MAX	PSI	
COEF		3387625049-				940527
STEADY		1652497748	4917949048	5188156848	7142695352	941527
1		2478748349-	3625471249	4391837249	6218028552	942527
2		4957503548-	5508327848	7410702848	4399575652	943527
3		1156750549-	2480585849-	2737038149	6124983652	944527
4		1652498548	2714615848-	3178032448	6026611952	945527
5						

LATERAL ACCEL		COSINE	SINE	MAX	PSI	
COEF		3013833349				950527
STEADY		1077338949	9757261747	1081748449	5175055551	951527
1		5238999749	1366010549	5414157649	7306929751	952527
2		4506667348-	1690001548-	4813123948	6685202952	953527
3		2985665549	3512598849-	4610048749	7759103452	954527
4		2886724248-	9757255047-	3047165448	3973509752	955527
5						

			STEADY	STATF	DATA			
						D E G	R E F S	
LIFT LINK	LOAD	K	0+11201K	30+11201K	60+11201K	90+11201K		
		0	5043361054	5156697054	4505026554	5326698054	1037627	
		1	5156697054	5326698054	4970029054	5156697054	1038627	
		2	4590027054	5496699054	5270031054	5553366054	1039627	
RT. CYCLIC	LOAD	0	2080000052	1872000053	3120000053	6240000052	1047627	
		1	4160000052			6240000052	1872000053	1048627
		2	2496000053	2080000052	8320000052	1040000052	1049627	
LT. CYCLIC	LOAD	0	4512000052	9024000052	4512000052	4512000052	1057627	
		1	9024000052	6768000052	9024000052	9024000052	1058627	
		2	4512000052	2256000052	1128000053		1059627	
COLLECTIVE	LOAD	0	1984000052	3968000052	1984000052	9920000052	1067627	
		1		5952000052	5952000052	3968000052	1068627	
		2		1190400053	3968000052	1984000052	1069627	
STABILIZER	BAR	0	2068000050	1654400051	3102000051	3774100051	1077627	
		1	2843500051	1654400051	2585000050	2119700051	1078627	
		2	3722400051	4342800051	3153700051	1964600051	1079627	

HARMONIC ANALYSIS

LIFT LINK	LOAD							
COEF		COSINE	SINE	MAX	PSI			
STEADY		5126002454						1080627
1		5396701752	7584886752	9308861152	3054521353			1081627
2		2361900051	2740024253	2740126053	1347530653			1082627
3		1416733352	9443950051	1702649452	1087708553			1083627
4		7319523352	1104193753	1324763353	1411505952			1084627
5		1146575052	1859515052	2184589752	4766841252			1085627

RT. CYCLIC	LOAD							
COEF		COSINE	SINE	MAX	PSI			
STEADY		7193333352						1090627
1		1710110052	2107779052	2714260252	5094645152			1091627
2		2513332252	1516121953	1536812953	4970627252			1092627
3		1040000252	8666675351	1353777352	1067314753			1093627
4		6153333852	4653442552	7714793852	5427457652			1094627
5		1409891752	8944404051	1669676152	6552176452			1095627

LT. CYCLIC	LOAD							
COEF		COSINE	SINE	MAX	PSI			
STEADY		1880000051						1100627
1		1916876352	1265625752	2297003152	1465650553			1101627
2		1128000452	6512506851	1302502452	1499998852			1102627
3		3759998351	7519988251	8407604351	3885502852			1103627
4		5263997752	7815014052	9422532452	7599080952			1104627
5		3687595050	6143743351	6154800251	1731302352			1105627

HARMONIC ANALYSIS

COLLECTIVE	LOAD							
COEF		COSINE	SINE	MAX	PSI			
STEADY		4298666752						1110627
1		7380647051	2863654751	7916720851	2012060153			1111627
2		1488000352	2863658851	1515305352	9544670252			1112627
3		1653332152	9920004251	1928100652	4967874052			1113627
4		3141334052	2863658251	3154359652	1302179951			1114627
5		4073982751	2863655751	4979744951	7020777451			1115627

STABILIZER	BAR							
COEF		COSINE	SINE	MAX	PSI			
STEADY		2283416750						1120627
1		9993731749	3819546851	3820854051	8850121652			1121627
2		3015831749	6716025049	7362080849	1470912453			1122627
3		1292504550	1206336750	1767997850	7434168152			1123627
4		3015795049	2238643349	3755867849	3585331852			1124627
5		5516361749	1182699450	1305021250	1299893152			1125627

		STEADY	STATE	DATA			
				D E G	R E E S		
			K	0+(120)K	30+(120)K	60+(120)K	90+(120)K
R F	PYLON		0	1475000049-	3540000049	6490000049	7375000049
			1	5605000049	1180000049	2950000048	5015000049
			2	7080000049	7080000049	3835000049	1475000048-
R A	PYLON		0	8100000049	1080000050	1110000050	1200000050
			1	7800000049	5700000049	9600000049	1140000050
			2	9600000049	1050000050	6900000049	3900000049
L F	PYLON		0	2250000049	3000000048-	2100000049-	4500000048-
			1	1200000049	4050000049	6000000048	1500000049-
			2	2400000049-	3000000048	2100000049	5700000049
L A	PYLON		0	1174250050	7930000049	3507500049	4117500049
			1	3050000049	9150000049	1037000050	6405000049
			2	2745000049	4270000049	4880000049	9760000049

HARMONIC ANALYSIS

R F		PYLON					
COFF			COSINE	SINE	MAX	PSI	
STEADY			1822708349				520327
1			8961730048-	2071938748	9198126748	1669820453	521327
2			3724374849-	1681893849	4086530949	1784825252	522327
3			9833406747	7374959847-	1229170148	1077101553	523327
4			5039575748-	4896655848	7026703448	3395601752	524327
5			8715427847-	1334429648-	1593855948	4736982752	525327

R A		PYLON					
COFF			COSINE	SINE	MAX	PSI	
STEADY			8950000049				530327
1			5464102548-	6964109748	8851849548	1281180553	531327
2			1100000049-	2684679249	2901293449	5614025652	532327
3			3499890048-	4999928347-	3535522048	6271000852	533327
4			1100001149	9526286348	1455164549	1022334752	534327
5			1464122248	3590100046	1464562348	2809278850	535327

L F		PYLON					
COFF			COSINE	SINE	MAX	PSI	
STEADY			7875000048				540327
1			7863624348	2491024748-	8248744848	3424229453	541327
2			1262499149	2792912249-	3065024449	1471622953	542327
3			7500003347	5000021747	9013897047	1127005752	543327
4			1125004248-	5412657548-	5528135748	6456460952	544327
5			3636258547-	7589735047-	8415845247	4888016452	545327

L A		PYLON					
COFF			COSINE	SINE	MAX	PSI	
STEADY			6493958349				550327
1			7529527748	1032462548-	7547784648	3521921953	551327
2			3876040549	4024708248-	3479716649	1734465853	552327
3			2033328848-	1779171748	2701828648	4627131252	553327
4			1131041849	4182175848-	1705886249	8492686552	554327
5			1366314048	2049137848	2462880348	1126112652	555327

			K	(120)K	D E G	R E E S	90+(120)K	
RED	PITCH LINK		0	8355000052-	1671000053-	2506500053-	1471600053-	507327
			1	8355000052	5570000052-	2228000053-	5570000052	508327
			2	1671000053	6355000052-	1671000053-	1671000053-	509327
WHITE	PITCH LINK		0	1166400053-	8748000052	2041200053	1312200053-	517327
			1	8748000052-	7290000052-	2916000052-	2041200053-	518327
			2	2332800053-	2770200053-	2916000052-	5832000052-	519327

HARMONIC ANALYSIS

RED		PITCH LINK					
COFF			COSINE	SINE	MAX	PSI	
STEADY			8819166752-				580327
1			8072929552-	4732714752-	9357925552	2103607553	581327
2			2320833052-	1607922052	2823416252	7264248952	582327
3			1346083353	4841681351-	1346083453	1123416953	583327
4			5105834852-	1607920852	513032652	4062995952	584327
5			1574596752	910445050	1571226952	6618697450	585327

WHITE		PITCH LINK					
COFF			COSINE	SINE	MAX	PSI	
STEADY			7897500052-				590327
1			7092129352	1021004753	1243166153	5521452252	591327
2			3523502052	1473108052	3819006152	1174443152	592327
3			9720002852-	2186999752	9763002752	5977320952	593327
4			5953498352-	1052222752-	6045768452	4750574252	594327
5			1746129852-	7330407851-	1891999252	4055919652	595327

IBM TAB NO. 3  
TYPE I STEADY STATE CONDITION NO. 29  
LEVEL FLIGHT, TRUE AIRSPEED 88 KNOTS



PER CENT CHORD	K	40		DELTA PER CENT	PRESSURE RADIUS	
		0*(120)K	D E G	30*(120)K	R E E S	60*(120)K 90*(120)K
4	0	2228215051	2666840051	2947560051	3436820051	17129
	1	3544070051	3280915051	3807265051	2315940051	18129
	2	1333420051	5614400050	6667100050	1368510051	19129
17	0	1099890051	1254420051	1308960051	1636200051	27129
	1	1818000051	1763460051	1906900051	1106980051	28129
	2	8544600050	5999400050	4635900050	8181000050	29129
34	0	5520000050	6360000050	6360000050	7920000050	37129
	1	8760000050	8880000050	9360000050	5760000050	38129
	2	3600000050	2040000050	1560000050	3600000050	39129
63	0	2392550050	2590100050	2721800050	3424200050	47129
	1	3775400050	3994900050	3819300050	2502300050	48129
	2	1821850050	1119450050	7463000049	1799900050	49129
88	0	1127850050	1050600050	1019700050	1405950050	57129
	1	1606800050	1699500050	1761300050	1498650050	58129
	2	6489000049	2317500049	5253000049	9270000049	59129

PER CENT CHORD	K	55		DELTA PER CENT	PRESSURE RADIUS	
		0*(120)K	D E G	30*(120)K	R E E S	60*(120)K 90*(120)K
2	0	4907520051	5207040051	4700160051	4700160051	147229
	1	4746240051	6865920051	6082960051	4654080051	148229
	2	3732480051	2903040051	2396160051	3548160051	149229
9	0	2886075051	3090600051	2999700051	3136050051	157229
	1	3136050051	4181400051	3545100051	2636100051	158229
	2	2136150051	1681650051	1318050051	2090700051	159229
17	0	2193125051	2386120051	2351030051	2421210051	167229
	1	2491390051	3123010051	2719475051	2000130051	168229
	2	1614140051	1298330051	1052700051	1579050051	169229
23	0	1724660051	1884680051	1706880051	1778000051	177229
	1	1849120051	2418080051	2098040051	1564640051	178229
	2	1209040051	9956800050	8534400050	1315720051	179229
34	0	1584000051	1729200051	1643400051	1735800051	187229
	1	1768800051	2125200051	1821600051	1438800051	188229
	2	1188000051	9900000050	8844000050	1221000051	189229
63	0	4884000050	5107850050	4741550050	5209600050	197229
	1	5494500050	6959700050	5942200050	4517700050	198229
	2	3317050050	2584450050	1689050050	3581600050	199229
90	0	1828950050	1949100050	1975600050	2242800050	207229
	1	2376300050	2616850050	2376300050	1668750050	208229
	2	1388400050	1134750050	9745500049	1361700050	209229

PER CENT CHORD	K	75		DELTA PER CENT	PRESSURE RADIUS	
		0*(120)K	D E G	30*(120)K	R E E S	60*(120)K 90*(120)K
2	0	7735880051	7169840051	5235870051	4811340051	377329
	1	5801910051	6226440051	6604800051	5990590051	378329
	2	6084930051	6132100051	5330210051	6792480051	379329
9	0	4745440051	4660700051	4109890051	3770930051	387329
	1	4575960051	4660700051	3940410051	3643820051	388329
	2	3770930051	3728560051	3262490051	4067520051	389329
17	0	3054075051	2798485051	2045520051	1761420051	397329
	1	2301210051	2386440051	2471670051	2272800051	398329
	2	2386440051	2358030051	2017110051	2556900051	399329
23	0	2992605051	3083290051	2513270051	2435540051	407329
	1	2668730051	2642820051	2668730051	2305990051	408329
	2	2305990051	2150530051	1969160051	2539180051	409329
34	0	1818240051	1789830051	1363680051	1250040051	417329
	1	1505730051	1633575051	1562550051	1363680051	418329
	2	1392090051	1363680051	1193220051	1534140051	419329
63	0	8333000050	7404550050	5576700050	5769000050	427329
	1	6570250050	7627900050	7692000050	6922800050	428329
	2	6794600050	6121550050	5640800050	7115100050	429329
90	0	3461250050	3443500050	3390250050	3567750050	437329
	1	3816250050	4473000050	4082500050	3560000050	438329
	2	3301500050	2982000050	2627000050	3068500050	439329

PER CENT CHORD	K	85		DELTA PER CENT		PRESSURE RADIUS	
		0+(120)K		D E G		R E E S	
				30+(120)K		60+(120)K	
2	0	9460860051	7552090051	4896410051	3900530051	6074 29	
	1	4398470051	5477340051	6556210051	6722190051	6084 29	
	2	7801060051	8630960051	7635080051	9377870051	6094 29	
4	0	9600120051	7422315051	4800060051	3733380051	6174 29	
	1	4266720051	5244510051	6222300051	5955630051	6184 29	
	2	6666750051	7822320051	6488970051	8266770051	6194 29	
9	0	6095610051	5684670051	3869585051	3150540051	6274 29	
	1	3356010051	4246380051	4451850051	4040919051	6284 29	
	2	4451850051	4725810051	4246380051	5410710051	6294 29	
13	0	4583700051	5093000051	3588250051	3009500051	6374 29	
	1	3379900051	3148400051	3241000051	2916900051	6384 29	
	2	3379900051	3657700051	3148400051	4874400051	6394 29	
17	0	4117680051	3823560051	3382380051	2843160051	6474 29	
	1	3137280051	3039240051	3039240051	2647080051	6484 29	
	2	2843160051	2941200051	2647080051	3529440051	6494 29	
23	0	3322395051	3114060051	2774145051	4155735051	6574 29	
	1	2500020051	2565810051	2653530051	2478090051	6584 29	
	2	2609670051	2675460051	2478090051	3026340051	6594 29	
34	0	2211175051	1853350051	1321200051	1376250051	6674 29	
	1	1376250051	1633150051	1743250051	1706550051	6684 29	
	2	1798300051	1853350051	1633150051	2036850051	6694 29	
47.7	0					6774 29	
	1					6784 29	
	2					6794 29	
63	0	8472800050	6188000050	2618000050	2760800050	6874 29	
	1	2665600050	4664800050	5902400050	6378400050	6884 29	
	2	7616000050	7806400050	6949600050	8377600050	6894 29	
77	0	3412800050	1327200050	1327200050-	8532000049-	6974 29	
	1	6636000049-	8532000049	2275200050	3033600050	6984 29	
	2	3886800050	4076400050	3412800050	4076400050	6994 29	
90	0	7072500049	8487000049-	2451800050-	2357500050-	7074 29	
	1	2263200050-	1320200050-	3772000049-	1886000049	7084 29	
	2	1037300050	1037300050	7544000049	1037300050	7094 29	

PER CENT CHORD	K	90		DELTA PER CENT		PRESSURE RADIUS	
		0+(120)K	D E G	30+(120)K	R E E S	60+(120)K	90+(120)K
2	0	1005290052	7619040051	4550260051	4338620051	7975.29	
	1	3809520051	5185180051	6455020051	6984120051	7985.29	
	2	8253960051	9841260051	8888880051	1026454052	7995.29	
9	0	6728410051	4885010051	3041610051	2580760051	8075.29	
	1	2488590051	3502460051	4055480051	4055480051	8085.29	
	2	4239820051	4700670051	4239820051	5161520051	8095.29	
17	0	5206960051	6153680051	4023560051	4023560051	8175.29	
	1	3550200051	3550200051	3550200051	3550200051	8185.29	
	2	4023560051	4496920051	3705220051	4970280051	8195.29	
23	0	3627480051	3480420051	5024550051	4902000051	8275.29	
	1	4436310051	2598060051	2451000051	2451000051	8285.29	
	2	2696100051	2892180051	2745120051	3333360051	8295.29	
34	0	2074240051	1759400051	1055640051	1037120051	8375.29	
	1	8148800050	1142240051	1389000051	1481600051	8385.29	
	2	1666800051	1777920051	1592720051	2000160051	8395.29	
63	0	7077800050	4444200050	1316800050	1316800050	8475.29	
	1	2304400050	4115000050	5267200050	5925600050	8485.29	
	2	7407000050	7900800050	6584000050	8230000050	8495.29	
90	0	1770000049-	1548750050-	2699250050-	2389500050-	8575.29	
	1	1504500050-	2655000049-	6195000049	1239000050	8585.29	
	2	1548750050	1637250050	8850000049	8850000049	8595.29	

PER CENT CHORD	K	95		DELTA PER CENT		PRESSURE RADIUS	
		0+(120)K	D E G	30+(120)K	R E E S	60+(120)K	90+(120)K
2	0	8268900051	5769000051	3557550051	2884500051	9676.29	
	1	2499900051	3749850051	4807500051	5384400051	9686.29	
	2	6634350051	8258900051	7451625051	8749650051	9696.29	
9	0	6315540051	4880190051	2870700051	2392250051	9776.29	
	1	2296560051	3349150051	3827600051	3523290051	9786.29	
	2	4593120051	5071570051	4593120051	5741400051	9796.29	
17	0	4315660051	5052480051	3263060051	2736760051	9876.29	
	1	2315720051	2947280051	2842020051	2631500051	9886.29	
	2	3157800051	3578840051	3263060051	4105140051	9896.29	
23	0	3144550051	3324975051	4020900051	3350750051	9976.29	
	1	3453850051	1958900051	1855800051	1958900051	9986.29	
	2	2268200051	2525950051	2422850051	2989900051	9996.29	
34	0					10076.29	
	1					10086.29	
	2					10096.29	
63	0	6151200050	3285300050	6990000049	1258200050	10176.29	
	1	2376600050	4194000050	5172600050	5731800050	10186.29	
	2	6710400050	7129800050	6011400050	6990000050	10196.29	
90	0	3480000049-	6090000049-	1261500050-	7830000049-	10276.29	
	1	1740000049-	4132500049	8265000049	1000500050	10286.29	
	2	1087500050	8700000049	2610000049	3480000049	10296.29	

		40		BLADE PER CENT	LOADING RADIUS		
				D E G	R E E S		
K		0+11201K	30+11201K	60+11201K	90+11201K		
0	8479924551	9728848151	1029157952	1254145852	17029		
1	1350568052	1321682052	1431141852	8886985251	18029		
2	5666838951	3094670051	2787259751	5745852851	19029		
		55		BLADE PER CENT	LOADING RADIUS		
				D E G	R E E S		
K		0+11201K	30+11201K	60+11201K	90+11201K		
0	1857692652	1997149552	1892230552	1982866152	27029		
1	2027925352	2609771652	2249755152	1707321652	28029		
2	1367086752	1097230552	8967826751	1374733352	29029		
		75		BLADE PER CENT	LOADING RADIUS		
				D E G	R E E S		
K		0+11201K	30+11201K	60+11201K	90+11201K		
0	2758935652	2629845552	2078358852	1948260952	37029		
1	2321992852	2482416052	2349777952	2157340552	38029		
2	2187886452	2119582152	1867154152	2361105352	39029		
		85		BLADE PER CENT	LOADING RADIUS		
				D E G	R E E S		
K		0+11201K	30+11201K	60+11201K	90+11201K		
0	3326102652	2835383652	1930975752	1917948852	47029		
1	181745652	2149459552	2346976852	2318894652	48029		
2	2590361652	2763802752	2426839752	3048613552	49029		
		90		BLADE PER CENT	LOADING RADIUS		
				D E G	R E E S		
K		0+11201K	30+11201K	60+11201K	90+11201K		
0	3366132052	2812922952	1811870652	1737015552	57029		
1	1609402852	1936682652	2239089052	2355116352	58029		
2	2677442052	2972148852	2623095552	3206423352	59029		
		95		BLADE PER CENT	LOADING RADIUS		
				D E G	R E E S		
K		0+11201K	30+11201K	60+11201K	90+11201K		
0	2811033652	2379654252	1680923752	1453848352	67029		
1	1480565952	1663813252	1844223352	1930670152	68029		
2	2284716552	2569830352	2302540852	2801139052	69029		

BLADE 0	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH
40			8479924551	
55			1857692652	
75			2758935652	
85			3326102652	
90			3366132052	
95			2811033652	

BLADE 30	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH
40			9728848151	
55			1997149552	
75			2629845552	
85			2835383652	
90			2812922952	
95			2379654252	

BLADE 60	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH
40			1029157952	
55			1892230552	
75			2078358852	
85			1930975752	
90			1811870652	
95			1680923752	

BLADE 90	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH
40			1254145852	
55			1982866152	
75			1948260952	
85			1917948852	
90			1737015552	
95			1453848352	

BLADE 120	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH
40			1350568052	
55			2027925352	
75			2321992852	
85			1817745652	
90			1609402852	
95			1480565952	

BLADE 150	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH
40			1321682052	
55			2609771652	
75			2482416052	
85			2149459552	
90			1936682652	
95			1663813252	

BLADE 180	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH
40			1431141852	
55			2249755152	
75			2399777952	
85			2396976852	
90			2239089052	
95			1844223352	

BLADE 210	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH
40			8886985251	
55			1707321652	
75			2157340552	
85			2318894652	
90			2355116352	
95			1930670152	

BLADE 240	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH
40			5666838951	
55			1367086752	
75			2187886452	
85			2590361652	
90			2677442052	
95			2284716552	

BLADE 270	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH
40			3094670051	
55			1097230552	
75			2119582152	
85			2763802752	
90			2972148852	
95			2569830352	

BLADE 300	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH
40			2787259751	
55			8967826751	
75			1867154152	
85			2426839752	
90			2623095552	
95			2302540852	

BLADE 330	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH
40			5745852851	
55			1374733352	
75			2361105352	
85			3048613552	
90			3206423352	
95			2801139052	

		HARMONIC		ANALYSIS		
		40		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	9021444251					70029
1	2436550351-	4481795851	5101300951	1185309453		71029
2	1636463551	9834570049-	1639416051	1782804353		72029
3	4364801749	1884926150-	1939787350	9433962752		73029
4	5854241850	1777433348-	5854268850	8995651252		74029
5	5228912250-	5260615049	5255306250	3485100452		75029
		55		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	1755045652					80029
1	2522729351-	5137426551	5723400651	1161533253		81029
2	2966375051	7877300049	2967420751	7605747850		82029
3	3565616750	1065385351	1123468751	2383190352		83029
4	4184076850	8871596750-	9808757750	7381245252		84029
5	2058611750	3561385050	4113556250	1199410052		85029
		75		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2276054752					90029
1	6351965050	7077271750	9509744250	4809151752		91029
2	2797543251	2996883349	2797703751	3068803250		92029
3	1539208851	1275230251	1998843651	1321388552		93029
4	3058460050	1925926750-	3614328650	8195029752		94029
5	3786105050-	2891016750-	4763671850	4347297052		95029
		85		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2460259052					100029
1	3549937351	3559534551-	5077160351	3149226653		101029
2	3057566551	3362445050	3075999651	3137836351		102029
3	1632365551	7719840050	1805706651	8436856351		103029
4	1409490551	4626668350-	1483483851	8545687952		104029
5	5366678350-	1022501750	5463217650	3384256952		105029
		90		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2445611852					110029
1	4495338551	5447648551-	7062927351	3095290753		111029
2	2817869551	4066675050	2847062951	4106038551		112029
3	1631539351	7053346750	1777475051	7793142851		113029
4	1329845851	3346885050-	1371315551	8646837352		114029
5	4916575050-	2268216749-	4921804350	3652828452		115029
		95		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2100246652					120029
1	4082809551	4491504051-	6069838651	3122710753		121029
2	1908069051	4027816749	1908494151	6046496450		122029
3	1247716351	7127361750	1436937351	9912138451		123029
4	6948733350	4866480050-	8483367450	8124872252		124029
5	4964695050-	3756686750-	6225824550	4342281652		125029

TOTAL		BLADE	THRUST
BLADE	POSITION	THRUST	
	0	3904348054	6029
	30	3765572054	306029
	60	3132601054	606029
	90	3213664154	906029
	120	3405411754	1206029
	150	3850912454	1506029
	180	3829750254	1806029
	210	3176230654	2106029
	240	2984079254	2406029
	270	2791636454	2706029
	300	2434934254	3006029
	330	3287752654	3306029

HARMONIC		ANALYSIS			
COEF	COSINE	SINE	MAX	PSI	
STEADY	3314741054				130029
1	5228430052-	3278936553	3320359953	9905983752	131029
2	4650859253	1147081752	4652273553	7064245450	132029
3	1494258853	1217458353	1927437253	1305722652	133029
4	1201088353	6829981752-	1381701753	8259382652	134029
5	5984175052-	4866216751	6003928052	3507021052	135029

PER	CENT	RADIUS	K	BEAM RED		BENDING BLADE		R E E S		90+11201K	
				0+11201K	30+11201K	D E G	30+11201K	60+11201K	90+11201K		
15	-		0	9300000051-	6700600054-			9133800054-	9742100054-	2172 29	
			1	1582510055-	1095870055-			1643340055-	7308900054-	2162 29	
			2	4571550054-	9217500053-			3640500054-	2442500054-	2192 29	
28	-		0	3113475054	6845000053-			1037800054-	2627650054-	2272 29	
			1	3334250054-	1391100054-			3687550054-	1545500053-	2282 29	
			2	1788600054	2671850054			3201800054	2870750053	2292 29	
36	-		0	2172500054	7150000053-			1168000054-	2838250054-	2372 29	
			1	2543500054-	1757500054-			3133000054-	7750000053-	2382 29	
			2	1779500054	2565500054			2958500054	1855000053-	2392 29	
45	-		0	8424000053	8964000053-			1807200054-	3546000054-	2472 29	
			1	2635200054-	3049200054-			3463200054-	1310400054-	2482 29	
			2	1836000054	3078000054			2125800054	4284000053	2492 29	
60	-		0	3625680054-	2651200054-			4487720054	5537160054-	2572 29	
			1	4750080054-	6399200054-			4825040054-	4412760054-	2582 29	
			2	2524800053-	1171760054			9271200053-	1114520054-	2592 29	
65	-		0	5205435054-	2950105054-			5127665054-	5944250054-	2672 29	
			1	5477630054-	7149685054-			4933240054-	5127665054-	2682 29	
			2	6947750053-	8217400053			2133520054-	1472475054-	2692 29	
80	-		0	6683300054-	3288700054-			5448900054-	4561675054-	2772 29	
			1	4445950054-	6143250054-			4080200054-	5448900054-	2782 29	
			2	2440050054-	1012775054-			4021625054-	2825800054-	2792 29	
92.5	-		0	3070000054-	1550000054-			2215000054-	1740000054-	2872 29	
			1	1265000054-	2025000054-			1265000054-	2025000054-	2882 29	
			2	9800000053-	8850000053-			1930000054-	1835000054-	2892 29	

WH.	BEAM	BEND	.1SR	K	D E G		R E E S		90+11201K	
					0+11201K	30+11201K	60+11201K	90+11201K		
WH.	BEAM	BEND	.1SR	0	1391850055-	7772500054-	5687250054-	3821500054-		7174 29
				1	5290000053-	7114000054-	3163000054-	8650500054-		7184 29
				2	9967500054-	8650500054-	1150400055-	7333500054-		7194 29
WH.	BEAM	BEND	.2SR	0	2396560054	4332600053	2097660054	2430160054		7274 29
				1	3263080054	6612000052-	2597240054	2325800053-		7284 29
				2	5655000053-	1564260054-	2063640054-	3990400053-		7294 29
					HARMONIC		ANALYSIS			

15	PER	CENT	RED	BLADE	BEAM	BENDING		
			RADIUS					
COEF			COSINE	SINE	MAX	PSI		
STEADY			6700600054-					290229
1			5296303254	5597172554-	7705788054	3134179453		291229
2			1089869354-	3073024353-	1132364754	9787323652		292229
3			2534582353	1520753853	2955807853	1032127752		293229
4			7601798152-	1317006753	1520751253	3000004752		294229
5			2662285854	1339071754	2980080354	5340279851		295229

28	PER	CENT	RADIUS				
COEF			COSINE	SINE	MAX	PSI	
STEADY			1545500053-				300229
1			1608373354	2418613754-	2904575254	3036238353	301229
2			3164975853-	1657318853	3572643053	7618075052	302229
3			5152294553	5152295053	7286445253	1500000152	303229
4			2208125752	8924019752-	9193146752	7097447752	304229
5			1276909454	2840931053	1308130954	2508630351	305229

36	PER	CENT	RADIUS				
COEF			COSINE	SINE	MAX	PSI	
STEADY			3083125053-				310229
			1324023354	2251205554-	2611697554	3004614853	311229
2			4912496253-	8508690452	4985639153	8508678952	312229
3			4585002753	6386253253	7861709753	1810786352	313229
4			7783333346	2836242852	2836242852	2249996152	314229
5			8702260753	1879533853	8902924553	2437557451	315229

45	PER	CENT	RADIUS				
COEF			COSINE	SINE	MAX	PSI	
STFADY			6997500053-				320229
1			1372453754	2572341854-	2915574054	2980818253	321229
2			7210496753-	1374382053	7340312653	8460419852	322229
3			5313003253	5934002253	7964947353	1605345152	323229
4			7245024852-	1792658252-	7463511752	4847443552	324229
5			2490454353	1462581753-	2888166953	6591507152	325229



		HARMONIC		ANALYSIS		
60	PER CENT	RED BLADE RADIUS	BEAM	BENDING		
COEF		COSINE	SINE	MAX	PSI	
STEADY		3150933354-				330229
1		1182573554-	2574848054-	2833429454	2946683353	331229
2		1027576154-	2001615253	1046889354	8448869552	332229
3		2686067853	5309665753	5950421053	2105531352	333229
4		5309736752-	7032708352-	8812053752	5823674952	334229
5		8515014753-	2486458553-	8870622953	3925565452	335229
65	PER CENT	RADIUS				
COEF		COSINE	SINE	MAX	PSI	
STEADY		3782892154-				340229
1		9976405553	2541816254-	2730589054	2914295853	341229
2		1108221954-	3367539353	1158256954	8154881452	342229
3		1360975853	5443897853	5611441753	2532124752	343229
4		3240501252-	1796022352-	1825021353	6494308852	344229
5		1269837154-	2967894553-	1304059254	3863103352	345229
80	PER CENT	RADIUS				
COEF		COSINE	SINE	MAX	PSI	
STEADY		4198427154-				350229
1		1380701253	1183457454-	1191484354	2766544353	351229
2		9740182053-	1169242753	9810110853	8657739652	352229
3		6429266751-	3986079253	3986597753	3030802252	353229
4		1189388353	5011063352-	1290640253	8428840652	354229
5		1443192054-	1923850053-	1455958554	3751861352	355229
92.5	PER CENT	RADIUS				
COEF		COSINE	SINE	MAX	PSI	
STEADY		1732083354-				360229
1		3631822253-	2010226053-	4151041053	2089646853	361229
2		3720831053-	4113623352	3743501353	8684560352	362229
3		1583323352	1899998053	1906583753	2841212852	363229
4		7916858351-	4113608352	4189077652	2522342352	364229
5		5551514753-	3647773352-	5563486153	3675187552	365229

		HARMONIC		ANALYSIS		
WH.	BEAM BEND .15R					
COEF		COSINE	SINE	MAX	PSI	
STEADY		7342645854-				750429
1		2255432354-	3098196754	3832205454	1260539653	751429
2		1033478854-	8078935053-	1311781354	1090077753	752429
3		6767925053-	6219178353-	9191462853	7419350352	753429
4		4572985052-	2376149253	2419753253	2522339952	754429
5		2445526854-	1305614854-	2772225054	4161936452	755429

		HARMONIC		ANALYSIS		
WH.	BEAM BEND .20R					
COEF		COSINE	SINE	MAX	PSI	
STEADY		3361583353				760429
1		1006193654-	1985568854	2225962554	1168737753	761429
2		4438935053-	1441587253	4667153153	8100414952	762429
3		3884068353-	5826102253-	7002103553	7876998152	763429
4		5548671052	4805279852	7340195152	1022333452	764429
5		1102299254-	3209689253-	1148078754	3924691652	765429

				CHORD RED	BENDING BLADE				
PER CENT RADIUS		K		0+(120)K	D E G 30+(120)K	R E E S 60+(120)K		90+(120)K	
15		0		7007000055	7007000055	5929000055		5120500055	671 29
		1		3773000055	2964500055	4851000055		5120500055	681 29
		2		5390000055	6063750055	6737500055		8624000055	691 29
28		0		6006100055	6182750055	5122850055		5122850055	771 29
		1		3886300055	3003050055	4946200055		4946200055	781 29
		2		4946200055	6094425055	5829450055		7860925055	791 29
60		0		2763300055	2717245055	2486970055		2371832555	871 29
		1		2164585055	1911282555	2625135055		2717245055	881 29
		2		2072475055	2924492555	2348805055		3615317555	891 29
80		0		1834365055	1834365055	1693260055		1622707555	971 29
		1		1622707555	1505120055	1787330055		1834365055	981 29
		2		1552155055	2093057555	1646225055		2140092555	991 29
WH.	CHORD	BEND	.15R	0	4810960055	4592280055	5795020055	6341720055	7374 29
				1	7435120055	9403240055	6997760055	6779080055	7384 29
				2	5685680055	5248320055	3717560055	2405480055	7394 29
WH	CHORD	BEND	.28R	0	4751010055	4607040055	4894980055	5902770055	7474 29
				1	6190710055	8062320055	5758800055	6046740055	7484 29
				2	5326890055	4894980055	3887190055	2951385055	7494 29
				HARMONIC ANALYSIS					

COEF	15	PER	CENT	RED	BLADE	CHORD	BENDING		
				RADIUS					
STEADY				COSINE	SINE	MAX	PSI		
				5715645855					100129
1				1740462855	8217152054	1924688755	3347268653		101129
2				2694991854	1944948354	3323523054	1790880252		102129
3				2245827054	4716243054	5423666054	815123152		103129
4				4491668353	3889830053	5941873553	7977677652		104129
5				4378789554	1215339054	4544320454	3910241652		105129

COEF	28	PER	CENT	RADIUS		MAX	PSI	
				COSINE	SINE			
STEADY				5328941755				110129
1				1232954555	7186780554	1427121255	3297624853	111129
2				1398471054	8924040053	1658947354	1627155252	112129
3				1766493754	4416243854	4756438754	8273287852	113129
4				2134520854	1274801753	2138324254	8914554752	114129
5				5263538354	2087337354	5062315154	4032631452	115129

	60	PER	CENT	RADIUS				
COEF				COSINE	SINE	MAX	PSI	
STEADY				2559890655				
1				3188766754	2008753254	3768729554	3277912653	120129
2				1727058254	6647466752	1728337054	1788978953	121129
3				7675803353	1918955854	2066777954	8273288352	122129
4				1112995754	1994215053	1130720354	8746045052	123129
5				1730355854	2673501554	3184610254	4741761452	124129

	80	PER	CENT	RADIUS				
COEF				COSINE	SINE	MAX	PSI	
STEADY				1763812655				130129
1				1132081254	1143335254	1608982054	3147166353	131129
2				5095430053		5095430053		132129
3				1959770053	2743691753	3371727053	7815415452	133129
4				7055256753	6789109052	7087846453	1374127251	134129
5				7009246753	1482782754	1640103654	4893989652	135129

HARMONIC ANALYSIS

WH. CHORD BEND .15R								
COEF	COSINE	SINE	MAX	PSI				
STEADY	5767685055							770429
1	1990828555	1135512855	2291896055	1503007853				771429
2	8200426753	1578173353	8350905953	1745533153				772429
3	2369038854	6195937254	6633399154	2302515552				773429
4	8200588353	1104727354	1375833954	7664679452				774429
5	6605267554	3078151753	6612435954	5336274450				775429

WH. CHORD BEND .28R								
COEF	COSINE	SINE	MAX	PSI				
STEADY	5272901355							780429
1	1341420255	7440454054	1533953055	1509841953				781429
2	6598560053	3117031753	7297731253	1673574353				782429
3	2879405254	4439079054	5291162154	1901019152				783429
4	5398941753	7273061753	9057924553	7664681752				784429
5	5495864554	2037579254	5861421054	4068429451				785429

			D E G R E E S			
			(120)K	30+(120)K	60+(120)K	90+(120)K
R/B	TORS	.15R	0	3706680054-	4324460054-	3088900054-
			1	3706680054-	4324460054-	3706680054-
			2	1235560054-	2471120054-	1235560054-
R/B	TORS	.50R	0	1597680054-	1902000054-	1902000054-
			1	1445520054-	1369440054-	1673760054-
			2	1103160054-	1141200054-	1235560054-

HARMONIC ANALYSIS

R/B	TORS	.15R	COEF	COSINE	SINE	MAX	PSI	
			STEADY	2831491754-				5603.29
			1	5249151853-	1190480554-	1301068754	2462060253	5613.29
			2	2059261353-	3566754753	4118530853	5999996952	5623.29
			3	4118536053-	5148168053-	6592872953	7711339352	5633.29
			4	1029635053-	1783175753	2059266253	3000001852	5643.29
			5	1009785052	5788338352	5875757552	1602084952	5653.29

R/B	TORS	.50R	COEF	COSINE	SINE	MAX	PSI	
			STEADY	1302870054-				5703.29
			1	3403117053-	4094299353-	5323954553	2302671853	5713.29
			2	9827013352	3843418352-	1055187453	1693195853	5723.29
			3	5706011752-	1902001053-	1985747653	8443357752	5733.29
			4	2853010052-	1262837353	1294663953	2568264652	5743.29
			5	5501136752	4705026552-	7238769252	6389204352	5753.29

		STEADY	STATE	DATA				
		K	U	E	G	R	E	S
RED BLADE	PITCH	0	0+(120)K	30+(120)K	60+(120)K	90+(120)K		
		1	1800231052	1520703052	1252822052	1113058052	8675 29	
		2	1136352052	1799410052	1485762052	1776937052	8685 29	
		2	2056465052	2231170052	2149641052	2021524052	8695 29	
RED BLADE	FLAP	0	1276800051-	2660000050-	8512000050	1064000051	8775 29	
		1	1170400051	6384000050	1383200051	4256000050	8785 29	
		2	5852000050-	8512000050-	1064000051-	5320000050-	8795 29	
VERTICAL	ACCEL	0	9269200050	1048720051	9634600050	1030450051	8875 29	
		1	9512800050	9817300050	9025600050	1048720051	8885 29	
		2	9543250050	1063945051	1006090051	1066990051	8895 29	
FORE- AFT	ACCEL	0	1520300050-	9915000049-	1322000049	1057600050-	8975 29	
		1	1057600050	1255900050-	1255900050-	1288950050-	8985 29	
		2	9915000048-	1057600050-	1222850050-	1652500050-	8995 29	
LATERAL	ACCEL	0	8112000049	1352000049	5746000049	9464000049-	9075 29	
		1		3380000049	7436000049		9085 29	
		2	5408000049	8788000049-	1690000049-	4732000049	9095 29	

# HARMONIC ANALYSIS

RED BLADE		PITCH				
COEF		COSINE	SINE	MAX	PSI	
STEADY		1653672952				9105 29
1		1371259051	5301323551	5475799751	2845024753	9115 29
2		7764883349	166666744	7764883349	8999994252	9125 29
3		1747073350	2329423350	2911782650	1771000452	9135 29
4		3882416749	6724200049	7764536449	7500031952	9145 29
5		2638250049	5629383349	6216938149	5902209652	9155 29

RED BLADE		FLAP				
COEF		COSINE	SINE	MAX	PSI	
STEADY		7980000049				9205 29
1		7785897850-	8889343750	1181696451	1312141153	9215 29
2		2660005349-	3071507849	4063223849	6544671252	9225 29
3		3103334250-	2394001250-	3919429250	7254921252	9235 29
4		6833333343	1535757249-	1535757249	6750006752	9245 29
5		2410766750-	1707344350-	2954119350	4306135052	9255 29

VERTICAL		ACCEL				
COEF		COSINE	SINE	MAX	PSI	
STEADY		9954325050				9305 29
1		2169497749	1928601549	2902397349	3183729753	9315 29
2		2156889749	1318523348	2160916149	8825091452	9325 29
3		6597383348	8627400048	1086082449	7753160752	9335 29
4		1446367249	1274583349	1927833249	3465312752	9345 29
5		2917300048	6094835048	6757044748	4888436852	9355 29

FORE- AFT		ACCEL			
COEF		COSINE	SINE	MAX	PSI
STEADY		1027304250-			
1		5286946748-	1150816849	1266450749	1146744453
2		3552872049-	4245617549	5536078749	6496185252
3		5508345048-	1156748749	1281205049	3848780852
4		1955459049-	2432883249-	3121336349	5780225252
5		2424735048-	5932283346	2425460648	3571970152
					9405 29
					9415 29
					9425 29
					9435 29
					9445 29
					9455 29

LATERAL		ACCEL				
COEF		COSINE	SINE	MAX	PSI	
STEADY		1352000049				950529
1		3902888348	1800503748	4298180048	2476510352	951529
2		5633333049	8781496748	5701367249	4430109751	952529
3		3379990848	1126664848	3562823648	6144989051	953529
4		2028000849	2829593549	3481291049	5859260752	954529
5		3902887348	4053834548	5627264348	4521736752	955529

			STEADY	STATE	DATA						
					D	L	U	R	L	S	
				0+11201K	30111201K	60+11201K	90+11201K				
LIFT LINK	LOAD		0	5043363054	5298364554	4816695054	5666700054				10376.29
			1	5185030554	5383365054	4760028054	5326698054				10386.29
			2	4816695054	5036701054	5440032054	5893368054				10396.29
RT. CYCLIC	LOAD		0	1456000053	3536000053	1456000053	2080000052				10476.29
			1	1040000053	2080000052	6240000052	3328000053				10486.29
			2	1248000053	4160000052	1040000053	5200000052				10496.29
LT. CYCLIC	LOAD		0	9024000052	1353600053	9024000052	2256000052				10576.29
			1	1579200053	1353600053	2256000052	1353600053				10586.29
			2	6768000052	4512000052	1804600053	5768000052				10596.29
COLLECTIVE	LOAD		0	3968000052	1984000052	1984000052	9920000052				10676.29
			1	3968000052	1936000052	3968000052	3968000052				10686.29
			2	3968000052	1587200053	1936000052	3968000052				10696.29
STABILIZER	BAR		0	8272000050	8272000050	2481600051	3619000051				10776.29
			1	3629800051	2088400051	1240800051	5170000050				10786.29
			2	1964600051	3207400051	3368800051	2068000051				10796.29

# HARMONIC ANALYSIS

LIFT LINK	LOAD							
COEF		COSINE	SINE	MAX	PSI			
STEADY		5288920154						10806.29
1		1379955853	1100007253	1764736253	3214405353			10816.29
2		1463905553	2371961253	2787331953	1191591653			10826.29
3		472866751	6138668352	6157008952	9146643952			10836.29
4		3777836752	4907560052	6173237652	1310273652			10846.29
5		1049500051	3638831752	3640364952	5366959152			10856.29

RT. CYCLIC	LOAD							
COEF		COSINE	SINE	MAX	PSI			
STEADY		1256666753						10906.29
1		2310554852	1331095051	2314385852	3567028853			10916.29
2		4766666252	9757220352	1085930353	3198161952			10926.29
3		1040000552	1733344251	1054366152	3154125451			10936.29
4		5806661852	1955688352	9849543352	3153103052			10946.29
5		6094478251	1335738351	1092385952	6356317652			10956.29

LT. CYCLIC	LOAD							
COEF		COSINE	SINE	MAX	PSI			
STEADY		3196000052						11006.29
1		1728876352	1880002351	1739668052	1737939753			11016.29
2		1708000852	9443141352	1218959353	1153884153			11026.29
3		1879999552	1504001852	2407575452	4711338452			11036.29
4		4323999052	4233131852	6051146352	5609790352			11046.29
5		2248776751	1880000751	2731108951	7979194851			11056.29

COLLECTIVE	LOAD							
COEF		COSINE	SINE	MAX	PSI			
STEADY		5456000052						11106.29
1		1210323851	1355096952	1360491252	2648961053			11116.29
2		3306667252	2290926052	4022734152	1073575053			11126.29
3		3306650051	1984000852	2011367352	3315409352			11136.29
4		2976000752	5727311551	3030610752	8727665652			11146.29
5		4516993851	3630972851	5795446151	7758792851			11156.29

STABILIZER	BAR							
COEF		COSINE	SINE	MAX	PSI			
STEADY		2326500050						11206.29
1		1061268251	3317327851	3482933751	1077394053			11216.29
2		8616800048	4477341749	4559504549	1295532153			11226.29
3		1033996750	1206336850	1588835350	1035337153			11236.29
4		2584965049	4477375049	5170003049	6000011852			11246.29
5		7619080049	2576108349	8042805149	3973621252			11256.29

			STEADY	STATE	DATA			
					D E G	R E E S		
					0+(120)K	30+(120)K	60+(120)K	
R F	PYLON		0	2360000049	5605000049	8555000049	8997500049	4473.29
			1	5015000049	1475000049	3245000049	7080000049	4483.29
			2	9145000049	9440000049	5310000049	1180000049	4493.29
R A	PYLON		0	1050000050	1260000050	1470000050	1080000050	4573.29
			1	8400000049	7500000049	1140000050	1380000050	4583.29
			2	1470000050	1080000050	7500000049	6300000049	4593.29
L F	PYLON		0	3000000048	1800000049	4500000049	1200000049	4673.29
			1	6000000048	5900000049	9000000048	2700000049	4683.29
			2	4800000049	1200000049	1800000049	5400000049	4693.29
L A	PYLON		0	9455000049	7320000049	3355000049	2287500049	4773.29
			1	4575000049	1006500050	8845000049	6100000049	4783.29
			2	2135000049	6100000048	5185000049	1098000050	4793.29
			HARMONIC		ANALYSIS			
R F	PYLON	COEF	COSINE	SINE	MAX	PSI		
		STEADY	5617291749				5203.29	
		1	4275612048	2998215548	5222083348	2150395553	5213.29	
		2	3195833349	2512195149	4065031049	7091483252	5223.29	
		3	9833235047	1229161248	1574091048	7711345152	5233.29	
		4	3933341548	3832167848	5491510348	1106339052	5243.29	
		5	8339571747	4434426047	9445241747	6639978752	5253.29	
R A	PYLON	COEF	COSINE	SINE	MAX	PSI		
		STEADY	1075000050				5303.29	
		1	5714103848	1299053848	5659908148	1671919953	5313.29	
		2	3750006848	3767210749	3785829149	4784234652	5323.29	
		3	1133333343	7833333342	1377699343	1155043952	5333.29	
		4	1250011348	1299027348	1802775748	7847459852	5343.29	
		5	1214126748	1299033048	1778086148	6261300652	5353.29	
L F	PYLON	COEF	COSINE	SINE	MAX	PSI		
		STEADY	4250000048				5403.29	
		1	6714106248	1799038548	6950954048	3450000153	5413.29	
		2	1274999049	3680608249	3895189349	1445533053	5423.29	
		3	5000013347	9999981747	1118033048	8114494852	5433.29	
		4	3250004548	3031088848	4444100448	5575097052	5443.29	
		5	2141088347	1990390047	8272278547	2100009452	5453.29	
L A	PYLON	COEF	COSINE	SINE	MAX	PSI		
		STEADY	5909375049				5503.29	
		1	5623277848	3950467048	6860745148	3495215352	5513.29	
		2	4168331749	1716895549	4508072649	1688068653	5523.29	
		3	2033332748	2287495048	3060567848	7612213652	5533.29	
		4	6100001048	4842520048	7788453848	5461112652	5543.29	
		5	5399348347	2169543548	2235721048	2079506252	5553.29	
					D E G	R E E S		
					1120)K	30+(120)K	60+(120)K	
RED	PITCH LINK		0	2506500053	3342000053	8355000052	8355000052	5073.29
			1	1114000053	1671000053	5570000052	2506500053	5083.29
			2	1114000053	1810250053	6962500052	1114000053	5093.29
WHITE	PITCH LINK		0	4374000052	1749600053		1312200053	5173.29
			1		5832000052	8748000052	2624400053	5183.29
			2	1458000053	2332800053	2041200053	8748000052	5193.29
			HARMONIC		ANALYSIS			
RED	PITCH LINK	COEF	COSINE	SINE	MAX	PSI		
		STEADY	9051250052				5803.29	
		1	1216325053	7130163552	1409907453	2103790753	5813.29	
		2	2436874052	5828712552	6317613852	5634444152	5823.29	
		3	6962518351	1230041753	1232010753	8892010052	5833.29	
		4	5221876352	2009896751	5225742952	4555105652	5843.29	
		5	3111998852	2965026051	3126091952	7091149252	5853.29	
WHITE	PITCH LINK	COEF	COSINE	SINE	MAX	PSI		
		STEADY	8262000052				5903.29	
		1	7593438552	1063965953	1307144453	5448485552	5913.29	
		2	6318001252	1683553552	6538462452	7460430251	5923.29	
		3	3158997552	6074997852	6847252252	2084186052	5933.29	
		4	1944000852	1433333346	1944000852	4500001152	5943.29	
		5	4191438252	5383400551	4225868452	3453622352	5953.29	

IBM TAB NO. 4  
TYPE I STEADY STATE CONDITION NO. 31  
LEVEL FLIGHT, TRUE AIRSPEED 113 KNOTS

		40		DELTA PER CENT	PRESSURE RADIUS		
PER CENT CHORD	K	0+11201K	D E G	30+11201K	R E E S	60+11201K	90+11201K
4	0	1596595051	2877380051	3228280051	3123010051	17131	
	1	3509000051	5263500051	4158165051	2228215051	18131	
	2	9649750050	3859900050	4210800050	1315875051	19131	
17	0	8726400050	1363500051	1381680051	1499850051	27131	
	1	1727100051	2636100051	2108880051	1008990051	28131	
	2	3454200050	2090700050	2908800050	7272000050	29131	
34	0	3960000050	6840000050	6780000050	6720000050	37131	
	1	8280000050	1338000051	1098000051	5040000050	38131	
	2	2760000050	1320000050	1080000050	3240000050	39131	
63	0	1756000050	2546200050	2524250050	2963250050	47131	
	1	3643700050	5750900050	4433900050	2065250050	48131	
	2	1338950050	1734050050	4170500049	1756000050	49131	
88	0	8961000049	9270000049	8188500049	1143300050	57131	
	1	1514100050	2332950050	2039400050	1390500050	58131	
	2	9424500049	6025500049	5098500049	9888000049	59131	
		55		DELTA PER CENT	PRESSURE RADIUS		
PER CENT CHORD	K	0+11201K	D E G	30+11201K	R E E S	60+11201K	90+11201K
2	0	4861440051	6082560051	5391360051	4377600051	147231	
	1	5276160051	6888960051	7326720051	5045760051	148231	
	2	3087360051	2257920051	2027520051	3173520051	149231	
9	0	2863350051	3772350051	3613275051	2976975051	157231	
	1	3567825051	4385925051	4226850051	2863350051	158231	
	2	1886175051	1408950051	1990800051	1818000051	159231	
17	0	2140490051	2701930051	2666840051	2386120051	167231	
	1	2842290051	3280915051	3052830051	2105400051	168231	
	2	1368510051	1017610051	7719600050	1368510051	169231	
23	0	1671320051	2133600051	2062480051	1706880051	177231	
	1	2098040051	2524760051	2453640051	1635760051	178231	
	2	1066800051	8534400050	7467600050	1102360051	179231	
34	0	1531200051	1947000051	1900800051	1709400051	187231	
	1	1914000051	2270400051	2098800051	1478400051	188231	
	2	1069200051	8580000050	8052000050	1108800051	189231	
63	0	4619450050	5718350050	5168900050	5128200050	197231	
	1	6043950050	7488800050	6919000050	4395600050	198231	
	2	2808300050	2523400050	2421650050	2991450050	199231	
90	0	1842300050	2242800050	2176050050	2309550050	207231	
	1	2950350050	3337500050	2883600050	1895700050	208231	
	2	1421850050	1468500050	1468500050	1762200050	209231	
		75		DELTA PER CENT	PRESSURE RADIUS		
PER CENT CHORD	K	0+11201K	D E G	30+11201K	R E E S	60+11201K	90+11201K
2	0	9339660051	8467015051	6344365051	4551905051	377331	
	1	4268885051	6226440051	7971730051	7028330051	378331	
	2	5896250051	6485875051	6084930051	6250025051	379331	
9	0	5338620051	7054605051	4999660051	3622635051	387331	
	1	3198935051	4978475051	4872550051	4131075051	388331	
	2	3474340051	3474340051	3304860051	3686190051	389331	
17	0	3409200051	3693300051	3196125051	2386440051	397331	
	1	1548345051	2713155051	3238740051	2698950051	398331	
	2	2272800051	2301210051	2102340051	2329620051	399331	
23	0	3342390051	3756950051	3536715051	2824190051	407331	
	1	2461450051	2886965051	3290570051	2603955051	408331	
	2	2150530051	2046890051	1943250051	2202350051	409331	
34	0	2102340051	2215980051	1761420051	1193220051	417331	
	1	1164810051	1676190051	2017110051	1534140051	418331	
	2	1278450051	1193220051	1022760051	1278450051	419331	
63	0	9518850050	8397100050	5897200050	4807500050	427331	
	1	5192100050	8236850050	9166300050	7467650050	428331	
	2	6410000050	5897200050	4102400050	4999800050	429331	
90	0	3869500050	3585500050	3408000050	3283750050	437331	
	1	3585500050	4987750050	4863500050	3674250050	438331	
	2	3124000050	3124000050	3177250050	2698000050	439331	



PER CENT CHORD	K	DELTA PER CENT			PRESSURE RADIUS		
		85 0+(120)K	D 30+(120)K	E G	R 60+(120)K	E S	90+(120)K
2	0	1087169052	9294880051		5975280051	3568570051	607431
	1	2365215051	5228370051		8630960051	8547970051	608431
	2	7759565051	9128900051		8672455051	9709830051	609431
4	0	1102236052	9777900051		6044520051	3422265051	617431
	1	2080915051	5244510051		8800110051	7111200051	618431
	2	6800085051	7022310051		6311190051	8800110051	619431
9	0	9485865051	7807860051		4383360051	2739600051	627431
	1	1814985051	4109400051		5684670051	4725810051	628431
	2	4314870051	4520340051		4349115051	5205240051	629431
13	0	5810650051	7130200051		4305900051	2500200051	637431
	1	1098300051	4213300051		4305900051	3495650051	638431
	2	3194700051	3472500051		3217850051	3935500051	639431
17	0	4411800051	6813780051		4509840051	2451000051	647431
	1	1960800051	3970620051		4509840051	3235320051	648431
	2	2745170051	2843160051		2500020051	3529440051	649431
23	0	3771960051	5120655051		5745660051	4561440051	657431
	1	3837750051	2796075051		3421080051	2796075051	658431
	2	2543880051	2609670051		2247825051	3026340051	659431
34	0	2458900051	2110250051		2440550051	2000150051	667431
	1	8074000050	1688200051		2238700051	1899225051	668431
	2	1706550051	1816650051		1431300051	1926750051	669431
47.7	0						677431
	1						678431
	2						679431
63	0	9234400050	6997200050		1666000050	1428000050-	687431
	1	6664000049-	4664800050		7901600050	7187600050	688431
	2	7520800050	8520400050		1009120051	7901600050	689431
77	0	4360800050	1327200050		2322600050-	3981600050-	697431
	1	2654400050-	8532000049		3128400050	3270600050	698431
	2	3792000050	5308800050		7204800050	3507600050	699431
90	0	1791700050	1037300050-		3253350050-	4526400050-	707431
	1	3866300050-	1603100050-			2829000049	708431
	2	1037300050	2263200050		3677700050	6601000049	709431

PER CENT CHORD	K	90		DELTA PER CENT	PRESSURE RADIUS		90+(120)K
		0+(120)K		D E G 30+(120)K	R E E S 60+(120)K		
2	0	1031745052	9206340051	6349200051	3386240051	797531	
	1	1904760051	4761900051	8571420051	9100520051	798531	
	2	8571420051	1026454052	8677240051	1089946052	799531	
9	0	9170915051	7419685051	3686800051	1843400051	807531	
	1	6451900050	2949440051	5576285051	4516330051	808531	
	2	4239820051	4700670051	3548545051	4885010051	809531	
17	0	6567870051	7277910051	4496920051	2662650051	817531	
	1	1420080051	4260240051	4496920051	4023560051	818531	
	2	3786880051	4141900051	2248460051	4496920051	819531	
23	0	4068660051	6274560051	6078480051	3725520051	827531	
	1	2205900051	4583370051	3186300051	2867670051	828531	
	2	2745120051	2892180051	1666680051	3137280051	829531	
34	0	2389080051	2444640051	4018840051	3518800051	837531	
	1	7222800050	1055640051	1814960051	1685320051	838531	
	2	1629760051	1889040051	1111200051	1852000051	839531	
63	0	7653900050	4773400050	8230000049-	2469000050-	847531	
	1	3292000049-	4444200050	7077800050	6913200050	848531	
	2	7736200050	8065400050	1020520051	7571600050	849531	
90	0	7965000049	1593000050-	3982500050-	3717000050-	857531	
	1	2478000050-	8850000048-	1239000050	1371750050	858531	
	2	1770000050	2743500050	5354250050	1371750050	859531	

PER CENT CHORD	K	95		DELTA PER CENT	PRESSURE RADIUS		90+(120)K
		0+(120)K		D E G 30+(120)K	R E E S 60+(120)K		
2	0	1028805052	7211250051	4134450051	1923000051	967631	
	1	9615000050	3653700051	6826650051	6730500051	968631	
	2	6874725051	9518850051	8557350051	9999600051	969631	
9	0	9090550051	6554765051	3253460051	1387505051	977631	
	1	9569000050	3253460051	5741400051	4784500051	978631	
	2	4688810051	5262950051	4210360051	5741400051	979631	
17	0	6210340051	6210340051	3684100051	1789420051	987631	
	1	7894500050	3368320051	3684100051	3052540051	988631	
	2	3263060051	3684100051	2420980051	4105140051	989631	
23	0	4124000051	7088125051	3969350051	5412750050	997631	
	1	1031000050	4020900051	2629050051	2422850051	998631	
	2	2422850051	2732150051	1546500051	3041450051	999631	
34	0					1007631	
	1					1008631	
	2					1009631	
63	0	6151200050	2376600050	2306700050-	1537800050-	1017631	
	1	6990000049	4751200050	7339500050	6850200050	1018631	
	2	7269600050	8248200050	8388000050	5452200050	1019631	
90	0	8700000049-	1609500050-	2153250050-	1457250050-	1027631	
	1		5655000049	1174500050	1131000050	1028631	
	2	1261500050	1522500050	4632750050	4567500049	1029631	

		40	BLADE PER CENT	LOADING RADIUS		
		D E G		R E S		
K	0+11201K	30+11201K	60+11201K	90+11201K		
0	6256003851	1030358352	1038952052	1113070052	17031	
1	1305585652	2014416852	1609708152	8107559751	18031	
2	3911499351	2456180951	1819439351	5407872951	19031	
		55	BLADE PER CENT	LOADING RADIUS		
		D E G		R E S		
K	0+11201K	30+11201K	60+11201K	90+11201K		
0	1812590152	2301674052	2183536552	1922780752	27031	
1	2266255552	2750887252	2651302452	1792103652	28031	
2	1194599552	9433736751	8302254551	1224894052	29031	
		75	BLADE PER CENT	LOADING RADIUS		
		D E G		R E S		
K	0+11201K	30+11201K	60+11201K	90+11201K		
0	3165122352	3351462552	2610690852	1940810952	37031	
1	1762751352	2637707052	2979936852	2442121452	38031	
2	2054510452	2037873852	1818091752	2030595352	39031	
		85	BLADE PER CENT	LOADING RADIUS		
		D E G		R E S		
K	0+11201K	30+11201K	60+11201K	90+11201K		
0	3988431352	3687115052	2840550252	1776752352	47031	
1	1148042052	2312937652	3214647152	2703153952	48031	
2	2527730452	2756753152	2612299752	2998561552	49031	
		90	BLADE PER CENT	LOADING RADIUS		
		D E G		R E S		
K	0+11201K	30+11201K	60+11201K	90+11201K		
0	4037909752	3781000852	2915339752	1882188952	57031	
1	6569259951	2052164752	2973474252	2754240052	58031	
2	2684308252	1033824052	2419227252	3079226352	59031	
		95	BLADE PER CENT	LOADING RADIUS		
		D E G		R E S		
K	0+11201K	30+11201K	60+11201K	90+11201K		
0	3668399752	3365534452	1568502852	4550834651	67031	
1	3452247051	2091335952	2611800552	2339123352	68031	
2	2396531452	2823305352	2380983952	2786890252	69031	

BLADE 0	LOADING AZIMUTH				BLADE 180	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			6256003851		40			1609708152	
55			1812590152		55			2631302452	
75			3165122352		75			2979936852	
85			3988431352		85			3214647352	
90			4037909752		90			2973474252	
95			3668399752		95			2611800552	
BLADE 30	LOADING AZIMUTH				BLADE 210	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			1030358352		40			8107559751	
55			2301674052		55			1792103652	
75			3351462552		75			2442121452	
85			3887115052		85			2703153952	
90			3781000852		90			2754240052	
95			3365534452		95			2339123352	
BLADE 60	LOADING AZIMUTH				BLADE 240	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			1078952052		40			3911499351	
55			2183536552		55			1194599552	
75			2610690852		75			2054510452	
85			2840550252		85			2527730452	
90			2915339752		90			2684308252	
95			1568502852		95			2396531452	
BLADE 90	LOADING AZIMUTH				BLADE 270	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			1113070052		40			2456180951	
55			1922780752		55			9433736751	
75			1950810952		75			2037873852	
85			1776752352		85			2756753152	
90			1882188952		90			3033824052	
95			4550834651		95			2823305352	
BLADE 120	LOADING AZIMUTH				BLADE 300	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			1305585652		40			1819439351	
55			2266255552		55			8302254551	
75			1762751352		75			1818091752	
85			1148042052		85			2612299752	
90			6569259951		90			2419227252	
95			3452247051		95			2380983952	
BLADE 150	LOADING AZIMUTH				BLADE 330	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			2014416852		40			5407872951	
55			2750887252		55			1224894052	
75			2637707052		75			2030595352	
85			2312937652		85			2998561552	
90			2052164752		90			3079226352	
95			2091335952		95			2786890252	

		HARMONIC		ANALYSIS		
		40		BLADE PER CENT	LOADING RADIUS	
COEF STEADY	COSINE	SINE	MAX	PSI		
1	9123288351	5471374551	6669185851	1248755353		70031
2	3813410551	1055854451	2861834851	1691747753		71031
3	2659938051	1376300051	1652027751	4119391852		72031
4	9137799250	1005545151	1015010651	6554226452		73031
5	1382958350	2421861550	3098973450	2572029652		74031
	1933448550					75031
		55		BLADE PER CENT	LOADING RADIUS	
COEF STEADY	COSINE	SINE	MAX	PSI		
1	1821185352	6828788351	7543149151	1151367353		80031
2	3204176751	5768473350	4000486351	4145312751		81031
3	3958678851	1760261851	1866047751	3646163252		82031
4	6193644350	2362201750	2445460050	7124844852		83031
5	6326750049	1714899750	198697250	4248404152		84031
	2700145050					85031
		75		BLADE PER CENT	LOADING RADIUS	
COEF STEADY	COSINE	SINE	MAX	PSI		
1	2402639552	1824842051	2214442051	5549371352		90031
2	1254474051	3189340351	6320795051	1515170552		91031
3	5457156551	2689194751	2781485051	3493360552		92031
4	7105566750	5905566749	1284325451	6590302750		93031
5	1282966351	3790398350	5381520950	8955183751		94031
	3820163350					95031
		85		BLADE PER CENT	LOADING RADIUS	
COEF STEADY	COSINE	SINE	MAX	PSI		
1	2730581352	2880008551	6181016951	3322286653		100031
2	5469051251	4166604551	7941123951	1582358852		101031
3	6760240851	2463899351	2977733351	4138774252		102031
4	1672153051	4751121750	2090359251	8671564552		103031
5	2035649851	4439046750	4497102650	1615671452		104031
	7202750049					105031
		90		BLADE PER CENT	LOADING RADIUS	
COEF STEADY	COSINE	SINE	MAX	PSI		
1	2689152452	4129837051	7616463451	3271647753		110031
2	6399606251	5668633051	6243138451	2172333052		111031
3	5984641351	1918893051	2465551951	4296550652		112031
4	1548158851	1616065751	3343472951	8277390752		113031
5	2926968251	2905563350	5531861350	6336901251		114031
	4707355050					115031
		95		BLADE PER CENT	LOADING RADIUS	
COEF STEADY	COSINE	SINE	MAX	PSI		
1	2236059652	7804841551	9407886651	3039416953		120031
2	5252883051	2980941351	8768315951	7937443751		121031
3	8246050751	4498466851	4505513251	3106827452		122031
4	2518826750	5952371750	1647186851	8470397352		123031
5	1535876751	4622001750	5414355450	1172233452		124031
	2819990050					125031

TOTAL	BLADE	THRUST
BLADE	POSITION	THRUST
	0	4243155854
	30	4686640254
	60	3814270854
	90	2960089854
	120	2862499754
	150	4489191754
	180	4696641654
	210	3462789454
	240	2752004154
	270	2691096554
	300	2347969454
	330	3040514054

6031  
306031  
606031  
906031  
1206031  
1506031  
1806031  
2106031  
2406031  
2706031  
3006031  
3306031

# HARMONIC ANALYSIS

COEF	COSINE	SINE	MAX	PSI
STEADY	3503905354			
1	6238715052-	4951342853	4990492253	9718145252
2	8733007253	2851431753	9186733853	9041241451
3	1668700853-	4005894553	4339556853	3753824352
4	1438409753	1062440253-	1788239853	8088740952
5	2515266751	3995200052	4003109952	1727951552

130031  
131031  
132031  
133031  
134031  
135031

PER CENT RADIUS	K	BEAM		BENDING		R E E S	90+(120)K	
		RED	BLADE	D E G	R E E S			
		O+(120)K	30+(120)K	60+(120)K	90+(120)K			
15	0	4857100054	2442500054-	6700600054-	6700600054-			217231
	1	8525500054-	1460850055-	1765000055-	1156700055-			218231
	2	1207300054	1550235055	1793555055	1580650055			219231
28	0	2053575054	1788600054	3312000053-	3245925054-			227231
	1	2804300054-	3334250054-	3687550054-	2274350054-			228231
	2	2318550054	7088100054	6558150054	3378450054			229231
36	0	6005000053	1386500054	4802500053-	4213750054-			237231
	1	3427750054-	3526000054-	3133000054-	2543500054-			238231
	2	1681250054	5120000054	4530500054	2075000053			239231
45	0	2214000053	1380600054	2340000053-	4953600054-			247231
	1	4374000054-	3049200054-	2966400054-	2552400054-			248231
	2	1877400054	5148000054	4899600054	8550000053-			249231
60	0	3775600054-	2051520054-	2913560054-	6923920054-			257231
	1	7448640054-	4525200054-	5499680054-	5424720054-			258231
	2	1039560054-	2858360054	2071280054	3063480054-			259231
65	0	5322090054-	1900210054-	3183415054-	7577420054-			267231
	1	8005155054-	4738815054-	62942.5054-	5905365054-			268231
	2	1511360054-	2843760054	8995103053	3416725054-			269231
80	0	7300500054-	4368800054-	5178875054-	6606150054-			277231
	1	5641775054-	4137350054-	5911800054-	5757500054-			278231
	2	2748650054-	1059000053	2440050054-	4484525054-			279231
92.5	0	3735000054-	2120000054-	2357500054-	2215000054-			287231
	1	1550000054-	1075000054-	1930000054-	1930000054-			288231
	2	9800000053-	6000000053-	1122500054-	2310000054-			289231
WH. BEAM BEND .15R		K	O+(120)K	D E G	R E E S	90+(120)K		
		0	9748000054-	8321250054-	1227000054	1428725055		717431
		1	1417750055	9458250054	1407000054-	7772500054-		718431
		2	9418750054-	6565250054-	5577500054-	7443250054-		719431
WH. BEAM BEND .20R		0	1397800054-	1564260054-	3096620054	7424580054		727431
		1	5926440054	2680470054	1598480054	8494100053		728431
		2	5655000053-	2895940054-	1564260054-	1897180054-		729431

# HARMONIC ANALYSIS

PER CENT	RADIUS	RED BLADE		BEAM		BENDING		
		COSINE	SINE	MAX	PSI			
15	COEF							
	STEADY	1073825054-						290231
	1	1100431355	1043543155-	1516552455	3165199353			291231
	2	4993129354-	4346127354-	6619680054	1105185153			292231
	3	6589933353	1520768353	6763132253	4331578951			293231
	4	7603580052	4389916752-	8779851852	8250001652			294231
	5	4097588353-	5139689753-	6573175853	4628732152			295231
28	COEF							
	STEADY	6256541753						300231
	1	3071576554	3676961754-	4791098954	3098739453			301231
	2	1427920754-	3314642253-	1465887454	9633433152			302231
	3	1619284253-	1280713254	1290909454	3240200952			303231
	4	7360426752-	1784809553	1930622653	2810272652			304231
	5	3908605052-	2093382053-	2129558753	5188478952			305231
36	COEF							
	STEADY	3165000053-						310231
	1	2211442854	2999910354-	3726921154	3063965253			311231
	2	1138061954-	3261666353	1183879054	8200389852			312231
	3	3438744753-	1588375554	1625172754	3407190052			313231
	4	9006236552-	2978046253	3111250953	2670660652			314231
	5	8190933350-	7858994352-	7859421152	5388057352			315231
45	COEF							
	STEADY	4548000053-						320231
	1	2012534554	3181983554-	3765011854	3023124653			321231
	2	1093649254-	5557283353	1226744754	7653150352			322231
	3	6623994753-	1973400554	2081605854	3618501852			323231
	4	1828496853-	2330475053	2962180653	3202945752			324231
	5	2437642053	1045831753	2652520053	4644197251			325231

## HARMONIC ANALYSIS

60	PER	CENT	RED BLADE RADIUS	BEAM	BENDING	
COEF			COSINE	SINE	MAX	PSI
STEADY			3144686754-			330231
1			1622366854-	3115661354-	3512750954	2975066053
2			1346155654-	2218004053	1364305854	8532184552
3			9869730353-	1948960254	2184619354	3895270652
4			1905233053-	1893422754-	2686068253	5620546752
5			2746446753	1734806353	2854179853	7486301051

65	PER	CENT	RADIUS			
COEF			COSINE	SINE	MAX	PSI
STEADY			3675958354-			340231
1			1533659754-	3039893254-	3404858754	2967714553
2			1493831054-	3984919753	1546068254	8253184452
3			1043413954-	2184041054	2420485054	3851196452
4			4115330253-	2974662853-	5077850153	5396508652
5			4184666751-	1334343352	1398422852	2148241652

80	PER	CENT	RADIUS			
COEF			COSINE	SINE	MAX	PSI
STEADY			4539172954-			350231
1			1682745052-	1786921254-	1787000454	2694604753
2			1346909654-	1948738553-	1360934054	9411628352
3			3600333253-	1407987354	1453290154	3478120852
4			3889648853-	2394167053-	4567428653	5290331152
5			3174907353-	1611168853-	3560323253	4138128252

92.5	PER	CENT	RADIUS			
COEF			COSINE	SINE	MAX	PSI
STEADY			1827083354-			360231
1			5856810753-	4426128353-	7341174653	2170792053
2			5937497053-	1919689853-	6240118653	9895843552
3			1425000753-	4433332253	4656722153	3593963652
4			2929166853-	1333333347-	2929166853	4500000852
5			1743192353-	7844588352	1911568853	3115432952

## HARMONIC ANALYSIS

WH. BEAM BEND .15R

COEF		COSINE	SINE	MAX	PSI	
STEADY		1425291754-				750431
1		4667996054-	9226115754	1033979755	1168373453	751431
2		4353417354-	5037453254-	6657940954	1145830553	752431
3		1280409853	7499590053-	7608107553	9322957952	753431
4		5670430353	1900932253-	5980578853	8536675352	754431
5		3694571753	4501753353	5823713853	1012488252	755431

WH. BEAM BEND .20R

COEF		COSINE	SINE	MAX	PSI	
STEADY		9742550053				760431
1		1827538254-	3510189254	3957439154	1175032153	761431
2		1290065354-	4805284353-	1376653954	1002147853	762431
3		1387163753	1359423554-	1366482554	9194210852	763431
4		2080755053	4805273352	2135520553	3250962251	764431
5		1906829753	2906474053	3476146053	1134652152	765431



				CHORD RED		BENDING BLADE			
PER CENT RADIUS		K		U E G	R E E S				
			0+11201K	30+11201K	60+11201K	90+11201K			
15	0	1078000056	6198500055	4716250055	6198500055	67131			
	1	2560250055	2695000054	4042500055	7815500055	68131			
	2	7815500055	6468000055	8624000055	1158850056	69131			
28	0	9539100055	5122850055	3974625055	6006100055	77131			
	1	2738075055	1055900055	4062950055	7419300055	78131			
	2	6712700055	6006100055	7949250055	9892400055	79131			
60	0	4329170055	2302750055	1657980055	3131740055	87131			
	1	1496787555	1266512555	2256695055	3638345055	88131			
	2	2763300055	2579080055	3592290055	3776510055	89131			
80	0	2163610055	1552155055	1128840055	1787330055	97131			
	1	1175875055	1175875055	1434567555	1928435055	98131			
	2	1693260055	1646225055	2116575055	1857882555	99131			
WH. CHORD	BEND .15R	0	3280200055	7653800055	7216440055	6123040055	737431		
		1	9075220055	1257410056	1104334056	6123040055	738431		
		2	4592280055	5685680055	2405480055	4373600054-	739431		
WH. CHORD	BEND .28R	0	3455280055	6982545055	6334680055	5614830055	747431		
		1	7990335055	1022187056	8926140055	5470860055	748431		
		2	4031160055	5470860055	2951365055	7198500054	749431		
		HARMONIC		ANALYSIS					

15 PER CENT	RED BLADE RADIUS	CHORD	BENDING	
COEF	COSINE	SINE	MAX	PSI
STEADY	6423083355			100131
1	2770321255	2445481055-	3695275055	101131
2	5389992054	5056865054	7390798254	102131
3	6288340054	2111082555-	2202748655	103131
4	4491662754	1166978354	4640783654	104131
5	3040366753-	1996487754	2019505254	105131

28 PER CENT	RADIUS			
COEF	COSINE	SINE	MAX	PSI
STEADY	5873612555			110131
1	2062180555	2074787055-	2925291455	111131
2	4416240754	2294750354	4976852554	112131
3	5005090054	1854824255-	1921166955	113131
4	5299498554	2294759554	5774998354	114131
5	1753866754	2199631254	2813258954	115131

60 PER CENT	RADIUS			
COEF	COSINE	SINE	MAX	PSI
STEADY	2732596855			120131
1	5974379854	6903546554-	9129740954	121131
2	2686537554	3321731753	2707019754	122131
3	1803823554	7330417054-	7549092154	123131
4	3415746354	2260142354	4095798654	124131
5	2584178354	2336429754	3483802754	125131

80 PER CENT	RADIUS			
COEF	COSINE	SINE	MAX	PSI
STEADY	1638385955			130131
1	1969916354	2819183054-	3439238754	131131
2	6075331553	3394433352-	6084806953	132131
3	5879391753	1998985354-	2083654254	133131
4	1195473854	1323840854	1783735454	134131
5	1087361254	1525723054	1873548854	135131

HARMONIC ANALYSIS

WH. CHORD BEND .15R				
COEF	COSINE	SINE	MAX	PSI
STEADY	6277938355			770431
1	3288084355-	2626204355	4208140655	771431
2	6378161354	2840738854	6982172954	772431
3	6195927354-	2350810355	2431091255	773431
4	2551281254	1893825754	3177359354	774431
5	2610942753	5671386553-	6243528453	775431

WH. CHORD BEND .28R				
COEF	COSINE	SINE	MAX	PSI
STEADY	5680816355			780431
1	2293067855-	2001598355	3043773355	781431
2	3899182754	1350720554	4126508554	782431
3	4559044354-	1811622855	1868107655	783431
4	1859625054	3013142554	3540795554	784431
5	1354421853	1179904354-	1187652654	785431

				D E U		K E S			
		(120)K		40+(1120)K		60+(1120)K		70+(1120)K	
R/B	TORS	.15R	0	5560020054-	7413360054-	6177800054-	4324460054-	487331	
			1	4324460054-	5560020054-	7104470054-	2471120054-	488331	
			2	1235560054-	5560020054-	4324460054-	3088900054-	489331	
R/B	TORS	.50R	0	1749840054-	2853000054-	2929080054-	1978080054-	497331	
			1	1597680054-	1217280054-	1293360054-	3043200054-	490331	
			2	1521600053-	1445520054-	2662800053-	1293360054-	499331	

# HARMONIC ANALYSIS

		R/B TORS		.15R					
COEF		COSINE		SINE		MAX		PSI	
STEADY		4762054254-		5111208053-		6692612753-		1081114454	
	1	5111208053-		1125204654-		1235851954		2455702253	
	2	6692612753-		1000000047		6692612753		8999999952	
	3	1081114454		1441487254-		1801858454		1022899653	
	4	8751891853-		3566756553-		9450786353		5054323252	
	5	2022300253		3014976553		3630396853		1122964152	

		R/B TORS		.50R					
COEF		COSINE		SINE		MAX		PSI	
STEADY		1423330054-		5753916553-		3170131751		1648398553	
	1	1423330054-		8877949853-		1057948754		2370522053	
	2	5753916553-		2690394253-		2690581053		1353375553	
	3	3170131751		3233400353-		3629338253		9900421452	
	4	1648398553		8235896752		2101785153		3923254852	
	5	1933701353-		2981748053		3494934353		1171147252	

		STEADY	STATE	DATA			
				D E U	R E E S		
		K	0+11201K	30+11201K	60+11201K	90+11201K	
RED BLADE	PITCH	0	2231170052	1852642552	1427527052	1194587052	867531
		1	1078117052	1287763052	1642996552	1963289052	868531
		2	2347640052	2819343552	2813520052	2452463052	869531
RED BLADE	FLAP	0	1808800051-	8512000050-	8512000050	2340800051	877531
		1	2979200051	2660000051	2128000051	1223600051	878531
		2	2128000050-	1808800051-	2447200051-	2340800051-	879531
VERTICAL	ACCEL	0	1033495051	9878200050	9177850050	9786850050	887531
		1	1173565051	9756400050	9086500050	9056050050	888531
		2	9208300050	1033495051	1207060051	1079170051	889531
FORE- AFT	ACCEL	0	3172800050-	2941450050-	1057600050-	1156750050-	897531
		1	2974500050-	3470250050-	3635500050-	1355050050-	898531
		2	4296500049-	1751650050-	2743150050-	3899900050-	899531
LATERAL	ACCEL	0	2399800050	9464000049-	3380000049-	4056000049-	907531
		1	2078000050-	1960400050	2366000050	7098000049-	908531
		2		1352000049-	1892800050-	1487200050	909531

# HARMONIC ANALYSIS

RED BLADE PITCH		COEF	COSINE	SINE	MAX	PSI	
STEADY			1925921652				910531
1		1	3181091251	7603621351-	8242232651	2927027553	911531
		2	3251476750-	5883866749-	3304285150	9512861952	912531
		3	3785245050-	5823530050	6945616050	4100784352	913531
		4	4610280050	2773838350	5380414650	7758449651	914531
		5	1383045050	6219150049	1516440550	4842412051	915531

RED BLADE FLAP		COEF	COSINE	SINE	MAX	PSI	
STEADY			2261000050				920531
1		1	2040941351-	1872242051	2769608551	1374685353	921531
		2	7536675049-	2303641749	7880877849	8150191852	922531
		3	7093315049	2039335850-	2159176250	9639298252	923531
		4	1329971749-	7678883348-	1535733449	5250023452	924531
		5	1608766748	1375250048-	2116469448	6389492552	925531

VERTICAL ACCEL		COEF	COSINE	SINE	MAX	PSI	
STEADY			1010150051				930531
1		1	5015499249	1618526349-	5270185949	3421148653	931531
		2	3425639249-	1015263350-	1071498850	1256774553	932531
		3	1573260049	5582635348	1669372649	6512324351	933531
		4	2156866249-	5493858349	5902080249	2785869452	934531
		5	3464800048-	5637113348-	6616788148	4768468452	935531

FORE- AFT ACCEL		COEF	COSINE	SINE	MAX	PSI	
STEADY			2382354250-				940531
1		1	2469252749-	1212753249-	2750996049	2061575953	941531
		2	1021795250-	1054248850	1468164150	6705220352	942531
		3	1432164849	2919419549-	3251785049	9871031652	943531
		4	4682095048-	1669627249-	1734034349	6358376352	944531
		5	3350582849	1267834849	3582430749	4145251651	945531

LATERAL ACCEL		COEF	COSINE	SINE	MAX	PSI	
STEADY			1464666749				950531
1		1	1137173849-	9365045048-	1473161649	2194727253	951531
		2	1388616550	2195375349-	1405863650	1755080153	952531
		3	3943331748	8449980048	9324807148	2166102152	953531
		4	9097828249	1253807850-	1549105050	7649133952	954531
		5	9118381748	4295050048	1007930349	5044387951	955531

		STEADY	STATE	DATA							
				U	E	G	R	E	E	S	
		K	0+11201K	30+11201K	60+11201K	90+11201K					
LIFT LINK	LOAD	0	5440032054	5525032554	5241697554	6601705554	1037631				
		1	6941707554	5724467054	4901695554	5156697054	1038631				
		2	4873362054	6143313054	7140042054	6176704054	1039631				
RT. CYCLIC	LOAD	0	1040000053	4264000053	3952000053	1764000053	1047631				
		1	1664000053	2080000052	6240000052	3536000053	1048631				
		2	3952000053	2288000053	1560000053	2080000052	1049631				
LT. CYCLIC	LOAD	0	1240800053	4060800053	1353600053	1579200053	1057631				
		1	2481600053	2143200053	4512000052	3722400053	1058631				
		2	1804800053	1804800053	2368800053	2707200053	1059631				
COLLECTIVE	LOAD	0	1190400053	1984000052	1190400053	1785600053	1067631				
		1	3968000052	1686400053	1289600053	4960000052	1068631				
		2	1587200053	2380800053	3968000052	1984000053	1069631				
STABILIZER	BAR	0	1137400051	2791800051	3929200051	2894200051	1077631				
		1	1602700051	1034000050	2171400051	3929200051	1078631				
		2	4653000051	3929200051	2688400051	1034000051	1079631				

# HARMONIC ANALYSIS

LIFT LINK	LOAD	COEF	COSINE	SINE	MAX	PSI	
		STEADY	5872118154				1080631
		1	2555434353	6156466751	2556175853	3586199253	1081631
		2	6351434853	7483946853	9815813053	1148397953	1082631
		3	4721550051	9445250051	1055963052	3885327952	1083631
		4	4958420052	3966906353	3997775053	2071882252	1084631
		5	1834820052	5523198352	5819289952	5767532452	1085631

RT. CYCLIC	LOAD	COEF	COSINE	SINE	MAX	PSI	
		STEADY	9753333352				1090631
		1	1830775552	1323225152	2258907652	3585818352	1091631
		2	1248000053	2671977253	2949062053	3248206652	1092631
		3	5199976751	3466650351	6249593751	1123002052	1093631
		4	1473333553	5404997352	1564313153	5004559952	1094631
		5	2707728551	1623448552	1645874552	1989382652	1095631

LT. CYCLIC	LOAD	COEF	COSINE	SINE	MAX	PSI	
		STEADY	8084000052				1100631
		1	1272373752	1190062852	1742178052	2230655153	1101631
		2	1785998352	6675326052	6910120652	1424893953	1102631
		3	7520018351	1880002552	2024825052	8273286052	1103631
		4	4606010252	2979473753	3014866053	6530303152	1104631
		5	1923629752	4380666751	1972879552	3343417452	1105631

COLLECTIVE	LOAD	COEF	COSINE	SINE	MAX	PSI	
		STEADY	8266666750				1110631
		1	1399398052	7380666751	1582105352	3321920653	1111631
		2	3802664052	8590473351	3898499852	8363473652	1112631
		3	2149330452	2645333852	3408432852	4303127552	1113631
		4	1669867053	8877337252	1891170453	6998995251	1114631
		5	2539338351	4073941751	4800745851	1161284052	1115631

STABILIZER	BAR	COEF	COSINE	SINE	MAX	PSI	
		STEADY	5126916750				1120631
		1	1744831351	3633133851	4030396651	6434711452	1121631
		2	3877489249	5223568049	6505427349	6329337652	1122631
		3	1637170850	1378663850	2140336950	4663307552	1123631
		4	4308078348	5223611749	5241346649	6632132652	1124631
		5	7328610249	8306725049	1107746450	6228407152	1125631

		STEADY	STATE	DATA		
				D E G	R E S	
R F	PYLON		K	0+11201K	30+11201K	60+11201K
			0	3097500049	9887500049	1607750050
			1	8555000049	7375000048	4277500049
			2	1681500050	1681500050	9145000049
						1180000049
R A	PYLON		0	9900000049	1470000050	1515000050
			1	7500000049	2100000049	1020000050
			2	1380000050	1140000050	6600000049
						1200000049
L F	PYLON		0	7500000048	6000000049	9300000049
			1	4500000048	6300000049	1200000049
			2	1005000050	4500000049	1200000049
						7800000049
L A	PYLON		0	7625000049	7625000048	5795000049
			1	1525000048	8540000049	7625000049
			2	6100000049	5642500049	8845000049
						5490000049
						9150000048
						477331
						478331
						479331
				HARMONIC	ANALYSIS	
R F	PYLON					
COEF		COSINE	SINE	MAX	PSI	
STEADY		9550625049				520331
1		2941183748	2653571848	3961313248	2220571853	521331
2		6748124549	4917942249	8350050249	1195797152	522331
3		1720815748	2949990548	3415208848	7991457852	523331
4		7743764348	5322456048	9396511348	8625395051	524331
5		1237963048	1178587748	1709275148	2728149952	525331
R A	PYLON					
COEF		COSINE	SINE	MAX	PSI	
STEADY		1007500050				530331
1		2723081348	5497604748	6135049248	1163502153	531331
2		1462499649	6040527549	6215052549	5180512052	532331
3		1249988048	2249993248	2573895848	8031518552	533331
4		9875016248	1753702349	2012618049	1515408552	534331
5		2473103848	9975941047	2666727748	6760639652	535331
L F	PYLON					
COEF		COSINE	SINE	MAX	PSI	
STEADY		2187500049				540331
1		7964110848	1000001348	8026647148	3528432053	541331
2		3049998249	6928203749	7569841249	1468802553	542331
3		1499953347	4999986747	9013832047	1087699553	543331
4		2500009248	8660255548	9013882148	6347446052	544331
5		1035882048	1000001248	1439810448	6320193852	545331
L A	PYLON					
COEF		COSINE	SINE	MAX	PSI	
STEADY		8006250048				550331
1		2988583248	2058263748	3628784848	3455552952	551331
2		6611665049	4270227349	8039503849	1639582253	552331
3		2541725847	2033333348	2049157948	3237506252	553331
4		2287491748	7924132048	8247695448	7152551452	554331
5		2734418048	7375693347	2632145948	3298091252	555331
				D E G	R E S	
				11201K	30+11201K	60+11201K
						90+11201K
RED	PITCH LINK		0	5013000053	6684000053	2506500053
			1	2785000052	6962500052	4177500053
			2	4734500053	5291500053	5848500053
						8355000052
WHITE	PITCH LINK		0	1749600053	1166400053	3207600053
			1	4374000053	8748000052	2916000053
			2	3061800053	3790800053	2041200053
						1166400053
				HARMONIC	ANALYSIS	
RED	PITCH LINK					
COEF		COSINE	SINE	MAX	PSI	
STEADY		2100354253				580331
1		2111288853	3688336052	2143263553	1899093453	581331
2		5453961352	3818813552	6658000052	7250032752	582331
3		1995916253	2274792353	2974019353	1040511253	583331
4		1868272353	2029999553	2758865653	5684391652	584331
5		3023776552	1135427852	3229925952	3188377052	585331
WHITE	PITCH LINK					
COEF		COSINE	SINE	MAX	PSI	
STEADY		1992600053				590331
1		1542582853	1102799053	1896240353	3556113952	591331
2		8140505052	3958436352	9069471652	1307962652	592331
3		1239300453	1579499853	2007656653	4270604952	593331
4		1324350153	1494154153	1996597053	5711192252	594331
5		2799166752	3359888851	2819259252	7063108652	595331

IBM TAB NO. 5  
TYPE I STEADY STATE CONDITION NO. 42  
HOVER OUT OF GROUND EFFECT

PER CENT CHORD	K	40		DELTA PER CENT	PRESSURE RADIUS	
		0+11201K	D E G	30+11201K	R E E S	90+11201K
4	0	2245160051	2210670051	2228215051	2105400051	17142
	1	2035220051	2070310051	2140490051	2070310051	18142
	2	1929950051	1824680051	1912405051	2070310051	19142
17	0	1163520051	1076260051	9817200050	1027170051	27142
	1	9999000050	1054440051	1072620051	9817200050	28142
	2	8999100050	8908200050	9817200050	1108980051	29142
34	0	6300000050	5880000050	5640000050	5520000050	37142
	1	5400000050	5280000050	5640000050	5640000050	38142
	2	5040000050	4920000050	5400000050	5640000050	39142
63	0	2370600050	2414500050	2282800050	2151100050	47142
	1	2063300050	2238900050	2326700050	2195000050	48142
	2	1975500050	2019400050	2195000050	2238900050	49142
88	0	1019700050	9579000049	9270000049	8961000049	57142
	1	9270000049	9888000049	1050600050	9115500049	58142
	2	8044000049	8652000049	1004250050	9733500049	59142

PER CENT CHORD	K	55		DELTA PER CENT	PRESSURE RADIUS	
		0+11201K	D E G	30+11201K	R E E S	90+11201K
2	0	4515840051	4469760051	4331520051	4055040051	147242
	1	3870720051	3778560051	3870720051	3962880051	148242
	2	3778560051	3937840051	3937840051	4101120051	149242
9	0	2908800051	2863350051	2863350051	2658825051	157242
	1	2590650051	2499750051	2590650051	2636100051	158242
	2	2522475051	2658825051	2590650051	2772450051	159242
17	0	2035220051	2035220051	1894860051	1894860051	167242
	1	1859770051	1754500051	1824680051	1824680051	168242
	2	1754500051	1859770051	1754500051	1894860051	169242
23	0	1457960051	1386840051	1351280051	1280160051	177242
	1	1280160051	1244600051	1244600051	1280160051	178242
	2	1209040051	1280160051	1262380051	1351280051	179242
34	0	1465200051	1457000051	1448800051	1372800051	187242
	1	1346400051	1293600051	1320000051	1346400051	188242
	2	1293600051	1333200051	1313400051	1399200051	189242
63	0	4639800050	4680500050	4436500050	4151400050	197242
	1	4040350050	4029300050	4232800050	4192100050	198242
	2	3988600050	4273500050	4110700050	4395600050	199242
90	0	2069250050	2002500050	1975800050	1922400050	207242
	1	1922400050	1869000050	1869000050	1842300050	208242
	2	1762200050	1882350050	1735500050	1975800050	209242

PER CENT CHORD	K	75		DELTA PER CENT	PRESSURE RADIUS	
		0+11201K	D E G	30+11201K	R E E S	90+11201K
2	0	6792480051	6603800051	6273610051	5967005051	377342
	1	5849080051	5518890051	5283040051	5660400051	378342
	2	5849080051	5778325051	6155685051	6485875051	379342
9	0	4067520051	4025150051	3898040051	3855670051	387342
	1	3770930051	3516710051	3347230051	3643820051	388342
	2	3622635051	3559060051	3813300051	3898040051	389342
17	0	2556900051	2485875051	2358030051	2144955051	397342
	1	2159160051	1960290051	1875060051	2059725051	398342
	2	2159160051	2102340051	2315415051	2358030051	399342
23	0	2578045051	2539180051	2461450051	2280080051	407342
	1	2280080051	2124620051	2020980051	2202350051	408342
	2	2202350051	2176440051	2422585051	2461450051	409342
34	0	1619370051	1562550051	1477320051	1377885051	417342
	1	1392090051	1264245051	1250040051	1363680051	418342
	2	1335270051	1306860051	1463115051	1534140051	419342
63	0	7051000050	6986900050	6538700050	6153600050	427342
	1	6153600050	5769000050	5961300050	6089500050	428342
	2	6345900050	6153600050	6377950050	6922800050	429342
90	0	1491000050	1491000050	1491000050	1349000050	437342
	1	1349000050	1366750050	1331250050	1349000050	438342
	2	1455500050	1437750050	1579750050	1544250050	439342

PER CENT CHORD	K	DELTA PER CENT		PRESSURE RADIUS		
		85	DELTA PER CENT	PRESSURE RADIUS		
		U+11201K	D L G 30+11201K	K L L S 60+11201K	90+11201K	
2	0	7801060051	7801060051	7178635051	6888170051	607442
	1	6639200051	6307240051	5892290051	6639200051	608442
	2	7220130051	6971160051	6174515051	7801060051	609442
4	0	7288980051	7288980051	6755640051	6400080051	617442
	1	6133410051	5866740051	5511180051	6133410051	618442
	2	6666750051	6400080051	7555650051	7200090051	619442
9	0	5684670051	5821650051	5376465051	5068260051	627442
	1	4897035051	4657320051	4451850051	4862790051	628442
	2	5205240051	4965525051	5821650051	5513445051	629442
13	0	3842900051	3842900051	3611400051	3518800051	637442
	1	3472500051	3194700051	3102100051	3426200051	638442
	2	3750300051	3541950051	4051250051	3773450051	639442
17	0	4117680051	4019640051	3823560051	3725520051	647442
	1	3970620051	3725520051	3529440051	3921600051	648442
	2	3921600051	3672580051	4215720051	3921600051	649442
23	0	2850900051	2872830051	2796075051	2697390051	657442
	1	2719320051	2565810051	2456160051	2697390051	658442
	2	2785110051	2642565051	2949585051	2763180051	659442
34	0	1844175051	1853350051	1779950051	1779950051	667442
	1	1798300051	1743250051	1734075051	1816650051	668442
	2	1871700051	1835000051	1926750051	1798300051	669442
47.7	0					677442
	1					678442
	2					679442
63	0	6854400050	7140000050	6902000050	6616400050	687442
	1	6664000050	6235600050	6330800050	6902000050	688442
	2	7044800050	6854400050	7282800050	6949600050	689442
77	0	2512200050	2559600050	2275200050	2275200050	697442
	1	2464800050	2180400050	2275200050	2464800050	698442
	2	2749200050	2654400050	2654400050	2749200050	699442
90	0	1886000049	2429000049		9430000048-	707442
	1	1414500049-	9430000048-		4715000048	708442
	2	3300500049	4715000048	1414500049	3772000049	709442



PER CENT CHORD	K	DELTA PER CENT			PRESSURE RADIUS	
		90			90+11201K	
		0+11201K	D E G 10+11201K	R E E S 60+11201K		
2	0	7936500051	8253960051	8888880051	8888880051	797542
	1	9417980051	9629620051	9523800051	9947080051	798542
	2	9629620051	9523800051	9523800051	7989410051	799542
9	0	5069350051	5161520051	5253690051	5161520051	807542
	1	6820580051	7189260051	6129105051	7650110051	808542
	2	6451900051	5484115051	6682325051	5069350051	809542
17	0	4260240051	4733600051	5029450051	5088620051	817542
	1	5325300051	5325300051	5384470051	5443640051	818542
	2	5325300051	5325300051	5206960051	4378580051	819542
23	0	2941200051	3235320051	3382380051	3382380051	827542
	1	3480420051	3480420051	3382380051	3578460051	828542
	2	3529440051	3431400051	3382380051	2941200051	829542
34	0	1574200051	1777920051	1889040051	1926080051	837542
	1	2000160051	2000160051	1963120051	2074240051	838542
	2	2037200051	1926080051	1889040051	1648280051	839542
63	0	5761000050	6419400050	6501700050	6419400050	847542
	1	6748600050	6419400050	6748600050	7242400050	848542
	2	7077800050	7242400050	6584000050	6254800050	849542
90	0	1770000050-	1416000050-	1504500050-	1504500050-	857542
	1	1062000050-	1194750050-	5310000049-	6637500049-	858542
	2	7080000049-	3982500049-	9735000049-	1062000050-	859542
PER CENT CHORD	K	DELTA PER CENT			PRESSURE RADIUS	
		95			90+11201K	
		0+11201K	D E G 30+11201K	R E E S 60+11201K		
2	0	6634350051	7499700051	8172750051	8268900051	967642
	1	8365050051	8268900051	8316975051	8557350051	968642
	2	8365050051	9086175051	7692000051	6586275051	969642
9	0	5454350051	6315540051	7368130051	7176750051	977642
	1	7463820051	7081070051	6607610051	7750890051	978642
	2	7415975051	7646580051	6698300051	5406485051	979642
17	0	3894620051	4420720051	4526180051	4526180051	987642
	1	4631440051	4526180051	4420720051	4526180051	988642
	2	4631440051	4736700051	4315660051	3947250051	989642
23	0	2371300051	2732150051	2969900051	2989900051	997642
	1	3144550051	2989900051	2938350051	3247650051	998642
	2	3093000051	3273425051	2732150051	2397075051	999642
34	0					1007642
	1					1008642
	2					1009642
63	0	5592000050	6011400050	6570600050	6570600050	1017642
	1	7129800050	6850200050	7479300050	7828800050	1018642
	2	7409400050	7619100050	5941500050	6011400050	1019642
90	0	4350000048	4350000048-	4045000049-		1027642
	1	2175000048-	1740000049	4567500049	2175000049	1028642
	2	1305000049	1740000049	4567500049-	8700000048	1029642

		40	BLADE PER CENT	LOADING RADIUS		
		D E G	D E G	R E E S		
K		0+11201K	30+11201K	60+11201K	90+11201K	
0	8113824651	8431137051	8211304551	7980877151	17042	
1	7758278351	7966849751	8286602651	7928548751	18042	
2	7242596051	7075052151	7642640351	8163394851	19042	
		55	BLADE PER CENT	LOADING RADIUS		
		D E G	D E G	R E E S		
K		0+11201K	30+11201K	60+11201K	90+11201K	
0	1755846352	1738357752	1705416652	1607881452	27042	
1	1571728452	1517950852	1553645752	1581668652	28042	
2	1513064052	1588456252	1554169152	1651693152	29042	
		75	BLADE PER CENT	LOADING RADIUS		
		D E G	D E G	R E E S		
K		0+11201K	30+11201K	60+11201K	90+11201K	
0	2337218452	2287323352	2180036752	2061745852	37042	
1	2049718852	1903391352	1853721552	1992205152	38042	
2	2021548852	1981319752	2144356452	2232646252	39042	
		85	BLADE PER CENT	LOADING RADIUS		
		D E G	D E G	R E E S		
K		0+11201K	30+11201K	60+11201K	90+11201K	
0	2807953752	2828045452	2665119252	2576323452	47042	
1	2568960752	2435282652	2377405752	2574940152	48042	
2	2714120152	2612616052	2418405652	2759674752	49042	
		90	BLADE PER CENT	LOADING RADIUS		
		D E G	D E G	R E E S		
K		0+11201K	30+11201K	60+11201K	90+11201K	
0	2589156252	2806573252	2941929352	2945315952	57042	
1	3273245952	3311976352	3201021252	3491428552	58042	
2	3284146552	3134870652	3202068052	2677071852	59042	
		95	BLADE PER CENT	LOADING RADIUS		
		D E G	D E G	R E E S		
K		0+11201K	30+11201K	60+11201K	90+11201K	
0	2386994152	2702914252	2964887752	2957194452	67042	
1	3076922952	2970648952	2946650152	3186406752	68042	
2	3086846052	3247137652	2731896252	2419829452	69042	

BLADE 0	LOADING AZIMUTH	THRUST	PER INCH	BLADE 180	LOADING AZIMUTH	THRUST	PER INCH
SPAN				SPAN			
40			8713824651	40			8286602651
55			1755846352	55			1553645752
75			2337218452	75			1853721552
85			2807954752	85			2357405752
90			2589156252	90			3201021252
95			2386994152	95			2946650152
BLADE 30	LOADING AZIMUTH	THRUST	PER INCH	BLADE 210	LOADING AZIMUTH	THRUST	PER INCH
SPAN				SPAN			
40			8633132051	40			7928548751
55			1738352152	55			1581668652
75			2287323352	75			1992205152
85			2828044452	85			2574940152
90			2806573252	90			3491428552
95			2702514252	95			3186406752
BLADE 60	LOADING AZIMUTH	THRUST	PER INCH	BLADE 240	LOADING AZIMUTH	THRUST	PER INCH
SPAN				SPAN			
40			8217304551	40			7242596051
55			1705418652	55			1513064052
75			2180036752	75			2021548852
85			2664119352	85			2714120152
90			2641420352	90			3284146552
95			2464863752	95			3086846052
BLADE 90	LOADING AZIMUTH	THRUST	PER INCH	BLADE 270	LOADING AZIMUTH	THRUST	PER INCH
SPAN				SPAN			
40			7480677151	40			7075052151
55			1607881452	55			1588456252
75			2071348852	75			1981339752
85			2678423452	85			2612616052
90			2644312452	90			3134870652
95			2467134452	95			3247137652
BLADE 120	LOADING AZIMUTH	THRUST	PER INCH	BLADE 300	LOADING AZIMUTH	THRUST	PER INCH
SPAN				SPAN			
40			7482344551	40			7642640351
55			1677238452	55			1554169152
75			2044338852	75			2144356452
85			2678423452	85			2918405652
90			2678423452	90			3202068052
95			2476942452	95			2731896252
BLADE 150	LOADING AZIMUTH	THRUST	PER INCH	BLADE 330	LOADING AZIMUTH	THRUST	PER INCH
SPAN				SPAN			
40			7482344551	40			8163394851
55			1677238452	55			1651693152
75			2044338852	75			2232646252
85			2678423452	85			2759674752
90			2678423452	90			2677071852
95			2476942452	95			2419829452

		HARMONIC		ANALYSIS	
		40	BLADE PER CENT	LOADING RADIUS	
COEF STEADY	COSINE	SINE	MAX	PSI	
1	7950758951	3340198750	4136445050	5385284252	70042
2	2439928350	4191915049	4619138250	2603407251	71042
3	4600077850	9962450049	1229076750	7805167552	72042
4	7197401749	2489306349	6804753049	5364499651	73042
5	6333068349	1925343349	4583858049	4970011251	74042
	4159441749				75042
		55	BLADE PER CENT	LOADING RADIUS	
COEF STEADY	COSINE	SINE	MAX	PSI	
1	1611658652	3545020050	9689884750	2145974852	80042
2	9018131750	3506398350	4678180350	2427448952	81042
3	3096860050	5912666749	4606156449	2458363151	82042
4	4568050049	8337733349	1698605450	7349240951	83042
5	1479892750	2514625350	2593596250	5683503452	84042
	6351383349				85042
		75	BLADE PER CENT	LOADING RADIUS	
COEF STEADY	COSINE	SINE	MAX	PSI	
1	2087104352	1977250050	1928136251	5885870051	90042
2	1917971351	2179515050	3415795550	1982401052	91042
3	2630090050	1907025050	4287944750	1111878053	92042
4	3839543350	1962731750	3468525250	3638433352	93042
5	2659781750	1340383349	1163395650	1323182651	94042
	1155648350				95042
		85	BLADE PER CENT	LOADING RADIUS	
COEF STEADY	COSINE	SINE	MAX	PSI	
1	2651570752	6949963350	1962045151	3392542753	100042
2	1834829251	1441956750	5001012350	7564129352	101042
3	2631888350	5832066749	2588830850	1156258753	102042
4	2501751750	4563326750	7778719050	3602022452	103042
5	6259565050	4552155050	4651374850	1395431852	104042
	1677430050				105042
		90	BLADE PER CENT	LOADING RADIUS	
COEF STEADY	COSINE	SINE	MAX	PSI	
1	3071567152	7487586750	3353630651	1929002853	110042
2	3269160351	8619183349	6331064650	8703082952	111042
3	6286358350	2426765050	4044176750	4629225252	112042
4	3307796350	8056831750	1315318151	3555718552	113042
5	1034756851	3366233349	5416414550	7125655050	114042
	5406445050				115042
		95	BLADE PER CENT	LOADING RADIUS	
COEF STEADY	COSINE	SINE	MAX	PSI	
1	2889860752	1051583350	4016776651	1621395153	120042
2	2814815051	1070634651	111541251	7552283452	121042
3	1935111351	545431750	6151575250	3484697152	122042
4	1544483350	3644030050	4732805550	2456640552	123042
5	5764366749	7441021750	7683704750	5657163952	124042
	1709923350				125042

TOTAL		BLADE	THRUST
BLADE	POSITION		THRUST
	0		344583454
	30		3475574654
	60		3425568354
	90		3302211354
	120		3425016154
	150		3219873354
	180		3202567854
	210		3461179754
	240		3287846054
	270		3278218054
	300		3461536754
	330		3440757554

6042  
306042  
606042  
906042  
1206042  
1506042  
1806042  
2106042  
2406042  
2706042  
3006042  
3306042

PARAMETER TOTAL

Coeff	Unit	Value	Unit	Value	Unit	Value
1	134683054					130042
2	8778861752	1889940052	8760842752	1217677552		131042
3	1029292052	4516670052	463243252	3075231452		132042
4	1151713352	4608157352	1201047252	3147070452		133042
5	2748258352	3741877352	4641486752	3177961752		134042
6	2255701752	1070270052	2680130752	6728722552		135042



		HARMONIC		ANALYSIS	
60	PER CENT	RED BLAD RADIUS	BEAM	BENDING	
COEF		COSINE	SINE	MAX	PSI
STEADY		1720446754-			330242
1		5683104553-	1320170153-	5834426053	331242
2		5591831753-	7032700052-	3660033353	332242
3		1874018352-	6407135253-	6311917653	333242
4		1561649752-	1244248853-	1254010653	334242
5		3621701553	1428365253-	3693192653	335242
65	PER CENT	RADIUS			
COEF		COSINE	SINE	MAX	PSI
STEADY		1955297154-			340242
1		6674924753-	1253378354-	6791581353	341242
2		4601390053-	4490075052-	4623245253	342242
3		5832766752-	7128918853-	7152740453	343242
4		4536570052	1571520553-	1635689953	344242
5		5897220853	2375889653-	6357834953	345242
80	PER CENT	RADIUS			
COEF		COSINE	SINE	MAX	PSI
STEADY		2391831754-			350242
1		9206443253-	2107700051	9206444353	351242
2		3536039353-	1447633753	3620892253	352242
3		1414418353-	4436128354-	4676158653	353242
4		6333333360-	2004418754-	2004418753	354242
5		8499226553	6771683353-	1086704054	355242
92.5	PER CENT	RADIUS			
COEF		COSINE	SINE	MAX	PSI
STEADY		1316458354-			360242
1		1523074553-	1612430754-	1548843053	361242
2		7895620852-	6170428352-	1166196653	362242
3		2375010052-	2276668753-	2227332753	363242
4		5145823752	1026406753-	1147463253	364242
5		4373091253	2735410353-	5158136553	365242
		HARMONIC		ANALYSIS	
WH.	BEAM	BEND	.15R		
COEF		COSINE	SINE	MAX	PSI
STEADY		5984062554-			750442
1		1240702654-	3373867553	1285564754	751442
2		1573083854	7603703354-	1747213754	752442
3		3658403352-	4207076253	4222952653	753442
4		1097701053-	3168202553	3352911453	754442
5		1167334954	7390041553-	1382020654	755442
WH.	BEAM	BEND	.25R		
COEF		COSINE	SINE	MAX	PSI
STEADY		7939233353			760442
1		2622987553-	1810608253	3187219253	761442
2		5051766053	7610575354-	3193516753	762442
3		1387165553-	4161500753	4386606453	763442
4		5548697852	3000000046-	5548697852	764442
5		6507054853	3475206553-	7376911453	765442

PER CENT RADIUS	K	CHORD FEET		BENDING BLADE		M E L S		
		0+120+K	30+120+K	60+120+K	90+120+K	60+120+K	90+120+K	
15	0	1007000055	6872250055	6737500055	5390000055			67142
	1	5390000055	6333250055	5659500055	4985750055			68142
	2	5659500055	7276500055	7067000055	6196500055			69142
28	0	5917750055	6182750055	5917750055	4946200055			77142
	1	4769550055	5476150055	4416250055	4681225055			78142
	2	4769550055	6359400055	5829450055	5652800055			79142
60	0	2486970055	2878437555	2579080055	2210640055			87142
	1	2026420055	2486970055	1911282555	2141557555			88142
	2	2026420055	2807355055	2486970055	2579080055			89142
80	0	1693260055	1810847555	1669742555	1552155055			97142
	1	1528637555	1716777555	1481602555	1505120055			98142
	2	1434567555	1740795055	1693260055	1646225055			99142
WH. CHORD BEND .15R	0	5576340055	5467000055	5704360055	7544660055			737442
	1	6669740055	6347200055	6997760055	738442			738442
	2	6779080055	5467000055	5467000055	6123040055			739442
WH. CHORD BEND .28R	0	4894980055	4966965055	5038970055	6334680055			777442
	1	6046740055	5614830055	5774755055	6762695055			784442
	2	5902770055	5038970055	4894980055	5758600055			749442

# HARMONIC ANALYSIS

COEF STEADY	15 PER CENT	RADIUS	CHORD		BENDING		
			COSINE	SINE	MAX	PSI	
1		6209729255			7368133954	3423195253	100142
2		7020099854	2237765854	4724751754	1029173154	1254465353	101142
3		3368818353	2245825754	6512921354	6889260054	3634184452	102142
4		1235214254	1963242354	6818095053	2078208454	8044677052	103142
5		1963242354			2078208454	8044677052	104142
1		5409906355			6857588154	3505682053	105142
2		6764887854	1123777254	2549711753	1061540454	9694887752	110142
3		1040464854	4563464554	5049396753	7040013552	6486647452	111142
4		1177660054	1920416754	1378754054	2364098754	6486647452	112142
5		4666666754					113142
1		3000465254			3018196854	3537687853	114142
2		2302781753	5275985053	6647416752	2376807353	8194911152	120142
3		7292011753	2012477754	2197020354	2197020354	3646147452	121142
4		3070713553	1944220053	1661111453	1661111453	3325110252	122142
5		6077800053	5734976753	6491339653	6491339653	6313152152	123142
1		1622707655			1040917554	5671748351	124142
2		1025373054	1018352254	2376120053	2570733353	1462052453	130142
3		9798740052	2376120053	9407018353	9915860253	3614494052	131142
4		3135648353	1018353353	1018353353	1175881353	2999975252	132142
5		5879230052	3464836753	1018329553	1611383153	8872436652	133142

# HARMONIC ANALYSIS

COEF STEADY	15 PER CENT	RADIUS	CHORD		BENDING		
			COSINE	SINE	MAX	PSI	
1		6277938355			7209373154	1567740453	770442
2		6625350354	2842477054	7840953353	1014639454	6447431152	771442
3		6378254353	2649227754	7840953353	5754064054	4365137952	772442
4		1093405754	1890811753	1890811753	1423287554	8158245352	773442
5		1184520554	1575137054	1890811753	4464604754	2594499852	774442
1		5560841355			5322482054	1850239153	780442
2		5141697254	1175414354	2078021753	3174300253	1104461653	781442
3		2399585053	4559044854	2077971753	4818451354	7622534052	782442
4		1559680354	3000000048	1816841054	2077971753	6750021052	783442
5		3000000048	1816841054	3441966753	1896592054	3266510352	784442



			0.100	0.100	0.100	0.100	0.100
R/B TORS	.15R	0	3706680054-	3088900054-	3088900054-	3088900054-	487342
		1	3706680054-	2471120054-	2471120054-	3088900054-	488342
		2	3088900054-	3088900054-	3706680054-	3088900054-	489342

R/B TORS	.50R	0	1369440054-	1293360054-	1293360054-	1217280054-	497342
		1	1407480054-	1293360054-	9890400053-	1369440054-	498342
		2	1141200054-	1217280054-	1293360054-	1217280054-	499342

HARMONIC ANALYSIS

R/B TORS	.15R					
COEF		COSINE	SINE	MAX	PSI	
STEADY		3140381754-				560342
1		2950955053-	2148130052	2995524653	1701039853	561342
2		1544454353	8916883582	1783380853	1499996252	562342
3		2059269853-	1029627553	2302331253	5114502552	563342
4		5148136752	2675069053-	2724156353	7022332952	564342
5		1167584353-	5148155052	1276043953	3124123852	565342

R/B TORS	.50R					
COEF		COSINE	SINE	MAX	PSI	
STEADY		1258490054-				570342
1		4460760052-	3843434052-	5888154652	2207485153	571342
2		9510188351	1647180052	1902009152	2999975252	572342
3		5706013352-	1333333347-	5706013352	6000004352	573342
4		6022986052	6039675052-	8529597552	7873018352	574342
5		8853265052-	3843414352	9651535352	3130663652	575342

		STEADY	FLAP	DATA		
		COSINE	SINE	MAX	PSI	
RED BLADE	PITCH					
		183112019	183112019	183112019	183112019	
		183112019	183112019	183112019	183112019	867542
		183112019	183112019	183112019	183112019	868542
		183112019	183112019	183112019	183112019	869542
RED BLADE	FLAP					
		1064000050	1064000050	1064000050	1064000050	877542
		1064000050	1064000050	1064000050	1064000050	878542
		1064000050	1064000050	1064000050	1064000050	879542
VERTICAL	ACCEL					
		1015225050	1015225050	1015225050	1015225050	887542
		1015225050	1015225050	1015225050	1015225050	888542
		1015225050	1015225050	1015225050	1015225050	889542
FORE-AFT	ACCEL					
		1852000049	1852000049	1852000049	1852000049	897542
		1852000049	1852000049	1852000049	1852000049	898542
		1852000049	1852000049	1852000049	1852000049	899542
LATERAL	ACCEL					
		4732000049	4732000049	4732000049	4732000049	907542
		4732000049	4732000049	4732000049	4732000049	908542
		4732000049	4732000049	4732000049	4732000049	909542
		HARMONIC	ASYMPTIC			
RED BLADE	PITCH					
COEF		COSINE	SINE	MAX	PSI	
STEADY		1838143650				910542
1		1838143650	4734933750	1838143650	1838143650	911542
2		1838143650	4734933750	1838143650	1838143650	912542
3		1838143650	4734933750	1838143650	1838143650	913542
4		1838143650	4734933750	1838143650	1838143650	914542
5		1838143650	4734933750	1838143650	1838143650	915542
RED BLADE	FLAP					
COEF		COSINE	SINE	MAX	PSI	
STEADY		1832500050				920542
1		1832500050	4734933750	1832500050	1832500050	921542
2		1832500050	4734933750	1832500050	1832500050	922542
3		1832500050	4734933750	1832500050	1832500050	923542
4		1832500050	4734933750	1832500050	1832500050	924542
5		1832500050	4734933750	1832500050	1832500050	925542
		HARMONIC	ASYMPTIC			
VERTICAL	ACCEL					
COEF		COSINE	SINE	MAX	PSI	
STEADY		1842675050				930542
1		1842675050	4734933750	1842675050	1842675050	931542
2		1842675050	4734933750	1842675050	1842675050	932542
3		1842675050	4734933750	1842675050	1842675050	933542
4		1842675050	4734933750	1842675050	1842675050	934542
5		1842675050	4734933750	1842675050	1842675050	935542
		HARMONIC	ASYMPTIC			
FORE-AFT	ACCEL					
COEF		COSINE	SINE	MAX	PSI	
STEADY		1806667490				940542
1		1806667490	4734933750	1806667490	1806667490	941542
2		1806667490	4734933750	1806667490	1806667490	942542
3		1806667490	4734933750	1806667490	1806667490	943542
4		1806667490	4734933750	1806667490	1806667490	944542
5		1806667490	4734933750	1806667490	1806667490	945542
		HARMONIC	ASYMPTIC			
LATERAL	ACCEL					
COEF		COSINE	SINE	MAX	PSI	
STEADY		1854000049				950542
1		1854000049	4734933750	1854000049	1854000049	951542
2		1854000049	4734933750	1854000049	1854000049	952542
3		1854000049	4734933750	1854000049	1854000049	953542
4		1854000049	4734933750	1854000049	1854000049	954542
5		1854000049	4734933750	1854000049	1854000049	955542

		COSINE		SINE		MAX		PSI	
LIFT LINE	LOAD		4904718954	7285516752	1326184352	1086119353			1090642
		1	5822601752	6952298352	1796634253	1695365254			1081642
		2	1618054253	6761766751	1746949452	5537063852			1082642
		3	1868884352	3600581752	6175088552	5414665152			1083642
		4	1735068352	7422183351	1685333752	6736376752			1085642
RT, CYCLIC	LOAD		4904718954	7285516752	1326184352	1086119353			1090642
		1	5822601752	6952298352	1796634253	1695365254			1081642
		2	1618054253	6761766751	1746949452	5537063852			1082642
		3	1868884352	3600581752	6175088552	5414665152			1083642
		4	1735068352	7422183351	1685333752	6736376752			1085642
COLLECTIVE	LOAD		1984000052	1984000052	1984000052	1984000052			1067642
		1	1984000052	1984000052	1984000052	1984000052			1068642
		2	1984000052	1984000052	1984000052	1984000052			1069642
		3	1984000052	1984000052	1984000052	1984000052			1069642
		4	1984000052	1984000052	1984000052	1984000052			1069642
STABILIZER	BAR		1134000051	1134000051	1134000051	1134000051			1077642
		1	1134000051	1134000051	1134000051	1134000051			1078642
		2	1134000051	1134000051	1134000051	1134000051			1079642
		3	1134000051	1134000051	1134000051	1134000051			1079642
		4	1134000051	1134000051	1134000051	1134000051			1079642
LIFT LINE	LOAD		4904718954	7285516752	1326184352	1086119353			1090642
		1	5822601752	6952298352	1796634253	1695365254			1081642
		2	1618054253	6761766751	1746949452	5537063852			1082642
		3	1868884352	3600581752	6175088552	5414665152			1083642
		4	1735068352	7422183351	1685333752	6736376752			1085642
RT, CYCLIC	LOAD		4904718954	7285516752	1326184352	1086119353			1090642
		1	5822601752	6952298352	1796634253	1695365254			1081642
		2	1618054253	6761766751	1746949452	5537063852			1082642
		3	1868884352	3600581752	6175088552	5414665152			1083642
		4	1735068352	7422183351	1685333752	6736376752			1085642
LIFT LINE	LOAD		4904718954	7285516752	1326184352	1086119353			1090642
		1	5822601752	6952298352	1796634253	1695365254			1081642
		2	1618054253	6761766751	1746949452	5537063852			1082642
		3	1868884352	3600581752	6175088552	5414665152			1083642
		4	1735068352	7422183351	1685333752	6736376752			1085642
COLLECTIVE	LOAD		1984000052	1984000052	1984000052	1984000052			1100642
		1	1984000052	1984000052	1984000052	1984000052			1101642
		2	1984000052	1984000052	1984000052	1984000052			1102642
		3	1984000052	1984000052	1984000052	1984000052			1103642
		4	1984000052	1984000052	1984000052	1984000052			1104642
STABILIZER	BAR		1134000051	1134000051	1134000051	1134000051			1104642
		1	1134000051	1134000051	1134000051	1134000051			1104642
		2	1134000051	1134000051	1134000051	1134000051			1104642
		3	1134000051	1134000051	1134000051	1134000051			1104642
		4	1134000051	1134000051	1134000051	1134000051			1104642
LIFT LINE	LOAD		4904718954	7285516752	1326184352	1086119353			1090642
		1	5822601752	6952298352	1796634253	1695365254			1081642
		2	1618054253	6761766751	1746949452	5537063852			1082642
		3	1868884352	3600581752	6175088552	5414665152			1083642
		4	1735068352	7422183351	1685333752	6736376752			1085642
RT, CYCLIC	LOAD		4904718954	7285516752	1326184352	1086119353			1090642
		1	5822601752	6952298352	1796634253	1695365254			1081642
		2	1618054253	6761766751	1746949452	5537063852			1082642
		3	1868884352	3600581752	6175088552	5414665152			1083642
		4	1735068352	7422183351	1685333752	6736376752			1085642
LIFT LINE	LOAD		4904718954	7285516752	1326184352	1086119353			1090642
		1	5822601752	6952298352	1796634253	1695365254			1081642
		2	1618054253	6761766751	1746949452	5537063852			1082642
		3	1868884352	3600581752	6175088552	5414665152			1083642
		4	1735068352	7422183351	1685333752	6736376752			1085642
COLLECTIVE	LOAD		1984000052	1984000052	1984000052	1984000052			1100642
		1	1984000052	1984000052	1984000052	1984000052			1101642
		2	1984000052	1984000052	1984000052	1984000052			1102642
		3	1984000052	1984000052	1984000052	1984000052			1103642
		4	1984000052	1984000052	1984000052	1984000052			1104642
STABILIZER	BAR		1134000051	1134000051	1134000051	1134000051			1104642
		1	1134000051	1134000051	1134000051	1134000051			1104642
		2	1134000051	1134000051	1134000051	1134000051			1104642
		3	1134000051	1134000051	1134000051	1134000051			1104642
		4	1134000051	1134000051	1134000051	1134000051			1104642

[illegible]

IBM TAB NO. 6  
TYPE I STEADY STATE CONDITION NO. 55  
HIGH ALTITUDE STALL THRESHOLD  
TRUE AIRSPEED 91 KNOTS

PER CENT CHORD	K	40		DELTA PER CENT	PRESSURE RADIUS	
		O+11201K	D E G 30+11201K	R E E S 60+11201K	90+11201K	
4	0	2351030051	3123010051	3070375051	3140555051	17155
	1	2754565051	2824745051	3509000051	1035155051	18155
	2	3859900050	3859900050	6667100050	1649230051	19155
17	0	1199880051	1472580051	1445310051	1563480051	27155
	1	1445310051	1590750051	1654380051	1027170051	28155
	2	3817800050	3454200050	4545000050	9271800050	29155
34	0	6540000050	8760000050	8400000050	8160000050	37155
	1	8040000050	9960000050	1038000051	9900000050	38155
	2	3420000050	2820000050	2580000050	5340000050	39155
63	0	2436450050	3490050050	2919350050	3204700050	47155
	1	3402250050	4499750050	4236350050	6782550050	48155
	2	3380300050	1229200050	2524250050	2458400050	49155
88	0	1205100050	1266900050	9888000049	1266900050	57155
	1	1390500050	2132100050	2858250050	2193900050	58155
	2	2657400050	1205100050	1884900050	1266900050	59155

PER CENT CHORD	K	55		DELTA PER CENT	PRESSURE RADIUS	
		O+11201K	D E G 30+11201K	R E E S 60+11201K	90+11201K	
2	0	5414400051	5806080051	5230080051	4216320051	147255
	1	3179520051	6359040051	6912000051	4308480051	148255
	2	1797120051	8294400050	1751040051	4147200051	149255
9	0	3636000051	4045050051	3908700051	3522375051	157255
	1	2772450051	4431375051	4249575051	3226950051	158255
	2	1749825051	1681650051	1545300051	2954250051	159255
17	0	2070310051	2456300051	2456300051	2193125051	167255
	1	1789590051	2789655051	2491390051	1719410051	168255
	2	1087790051	1017610051	7193450050	1614140051	169255
23	0	1653540051	1991360051	1849120051	1564640051	177255
	1	1333500051	2258060051	1991360051	1422400051	178255
	2	1137920051	9423400050	5689600050	1297940051	179255
34	0	1379400051	1650000051	1544400051	1432200051	187255
	1	1240800051	1834800051	1636800051	1161600051	188255
	2	1062600051	9042000050	4818000050	1135200051	189255
63	0	4497350050	5820100050	4721200050	4700850050	197255
	1	4599100050	6552700050	5779400050	4904350050	198255
	2	5636950050	2889700050	2096050050	4049650050	199255
90	0	8410500049	1054650050	9078000049	9612000049	207255
	1	1094700050	1388400050	1335000050	2042550050	208255
	2	3511050050	8410500049	5073000049	1041300050	209255

PER CENT CHORD	K	75		DELTA PER CENT	PRESSURE RADIUS	
		O+11201K	D E G 30+11201K	R E E S 60+11201K	90+11201K	
2	0	254750051	6839650051	5589645051	4268885051	377355
	1	4292470051	6037760051	7452860051	8113240051	378355
	2	7641540051	4599075051	4905680051	8042485051	379355
9	0	4639515051	6270760051	5147955051	3474340051	387355
	1	3220120051	5211510051	6207205051	4152260051	388355
	2	3495525051	2076130051	2626940051	4321740051	389355
17	0	2613720051	2798385051	3565455051	2471670051	397355
	1	1917675051	2372235051	2826795051	2698950051	398355
	2	2159160051	1079580051	1463115051	2954640051	399355
23	0	2396675051	2992605051	3420120051	2668730051	407355
	1	2150530051	2720550051	2888965051	2565090051	408355
	2	1995070051	1140040051	1360275051	2914875051	409355
34	0	1647780051	1846650051	1619370051	1193220051	417355
	1	1136400051	1661985051	1931880051	1690395051	418355
	2	1207425051	6818400050	6534300050	1818240051	419355
63	0	7884300050	7339450050	4262650050	4583150050	427355
	1	5288250050	7211250050	7820200050	6602300050	428355
	2	6634350050	5128000050	4999800050	7627900050	429355
90	0	3017500050	1082750050	3195000049	5502500049	437355
	1	8875000049	1650750050	1917000050	2201000050	438355
	2	4260000050	2591500050	2130000050	3408000050	439355

PER CENT CHORD	K	85	DELTA PER CENT	PRESSURE RADIUS		
		O+(120)K	D E G 30+(120)K	R L E S 60+(120)K		
2	0	8299000051	6556210051	5186675051	3153620051	607455
	1	2406710051	4730430051	7137140051	7884050051	608455
	2	7842555051	6639200051	6058270051	7552090051	609455
4	0	8666775051	4844530051	5244510051	3244485051	617455
	1	2000025051	4666725051	7511205051	8355660051	618455
	2	7288980051	4666725051	5200065051	6355635051	619455
9	0	6575040051	6301080051	4725810051	2945070051	627455
	1	2294415051	4040910051	6780510051	6403815051	628455
	2	5616180051	3184785051	3458745051	5958630051	629455
13	0	4143850051	5417100051	3958650051	2639100051	637455
	1	1782550051	3819750051	5903250051	3472500051	638455
	2	3958650051	2453900051	2245550051	4305900051	639455
17	0	3529440051	5980440051	4852980051	3431400051	647455
	1	2451000051	4558860051	4313760051	3823560051	648455
	2	3529440051	2156890051	2156880051	3970620051	649455
23	0	2302650051	4364070051	5241270051	4103910051	657455
	1	3245640051	3190815051	2807040051	2763180051	658455
	2	2697390051	1666680051	1458345051	3223710051	659455
34	0	1376250051	1835000051	3163725051	1642325051	667455
	1	6606000050	1431300051	1890050051	1890050051	668455
	2	1761600051	1367075051	9450250050	2183650051	669455
47.7	0					677455
	1					678455
	2					679455
63	0	6330800050	5521600050	9520000049	1047200050	687455
	1	1047200050	4760000050	7425600050	7616000050	688455
	2	7473200050	9282000050	5922470050	12556640051	689455
77	0	3981600050	1042800050	2180400050	1896000050	697455
	1	1232400050	9480000049	2796600050	3555000050	698455
	2	4360800050	7394400050	4882200050	7062600050	699455
90	0	2640400050	4715000049	2451800050	2451800050	707455
	1	2074600050	6129500049	6601000049	1414500050	708455
	2	2640400050	5705150050	2546100050	3206200050	709455

PER CENT CHORD	K	90		DELTA PER CENT		PRESSURE RADIUS	
		O+11201K		D E G 30+11201K		R E E S 60+11201K	
						90+11201K	
2	0	9523800051	7407400051	5608460051	3756610051	797555	
	1	2645500051	5238090051	6148140051	9100520051	798555	
	2	9629620051	8730150051	8253960051	1015872052	799555	
9	0	7419685051	5253690051	3640715051	2027740051	807555	
	1	9677850050	3225990051	5622370051	6774495051	808555	
	2	5991050051	4239670051	3318120051	5991050051	809555	
17	0	5029450051	5088620051	3905220051	2485140051	817555	
	1	1656760051	4319410051	6035340051	3905220051	818555	
	2	4141900051	2758500051	2603480051	4201070051	819555	
23	0	2965710051	6201030051	5588620051	3970620051	827555	
	1	2916690051	5122590051	3284340051	2965710051	828555	
	2	3137280051	2254920051	1715700051	3088260051	829555	
34	0	1314520051	2148320051	4370720051	3296560051	837555	
	1	6296800050	9074800050	1629760051	1740880051	838555	
	2	1870520051	1500120051	1037120051	2037200051	839555	
63	0	1069900050	3374300050	2551300050	7407000049-	847555	
	1	4938000049	3868100050	6254600050	7242400050	848555	
	2	7677800050	8230000050	6254600050	1193350051	849555	
90	0	3097500049	3451500050-	6903000050-	5133000050-	857555	
	1	3363000050-	1106250050-	8407500049	1681500050	858555	
	2	2655000050	7876500050	5177250050	1008900051	859555	

PER CENT CHORD	K	95		DELTA PER CENT		PRESSURE RADIUS	
		O+11201K		D E G 30+11201K		R E E S 60+11201K	
						90+11201K	
2	0	7788150051	5384400051	3557550051	1874925051	967655	
	1	8653500050	3124875051	5384400051	6634350051	968655	
	2	8124675051	8076600051	6730500051	8605425051	969655	
9	0	6937525051	4497430051	2870700051	1339660051	977655	
	1	7176750050	2679320051	4593120051	6124160051	978655	
	2	5789245051	5119415051	2775010051	6124160051	979655	
17	0	4999850051	4526180051	3052540051	1789420051	987655	
	1	9473400050	2894650051	4684070051	3263060051	988655	
	2	3263060051	3052540051	1368380051	3999880051	989655	
23	0	3221875051	5155000051	4681050051	9279000050	997655	
	1	2062000050	4046675051	3093000051	2422850051	998655	
	2	2525950051	2371300051	1185650051	3299200051	999655	
34	0					1007655	
	1					1008655	
	2					1009655	
63	0	3564900050	2097000050	1048500050-	8388000049-	1017655	
	1	9087000049	3634800050	6430800050	7129800050	1018655	
	2	7409400050	8108400050	5032800050	1062480051	1019655	
90	0	1370250050-	8700000049-	2740500050-	5872500049-	1027655	
	1	2175000048-	4132500049	9135000049	8265000049	1028655	
	2	1022250050	2240250050	2523000050	3153750050	1029655	



		40	BLADE PER CENT	LOADING RADIUS		
		D E G	R E F S			
K	0+11201K	30+11201K	60+11201K	90+11201K		
0	9202893051	1209079452	1145455252	1190171352	17055	
1	1125186752	1304007952	1440926452	1073246452	18055	
2	4975439051	3022022351	4512789951	7373610751	19055	
		55	BLADE PER CENT	LOADING RADIUS		
		D E G	R E F S			
K	0+11201K	30+11201K	60+11201K	90+11201K		
0	1849610452	2152716252	1996122352	1796193252	27055	
1	1509994652	2399598452	2257775152	1657759452	28055	
2	1265380952	4016361451	7025184051	1510242252	29055	
		75	BLADE PER CENT	LOADING RADIUS		
		D E G	R E F S			
K	0+11201K	30+11201K	60+11201K	90+11201K		
0	2597216152	2740975852	2394525352	1807622652	37055	
1	1703581752	2441051752	2846918452	247328052	38055	
2	2172557052	1316666452	1436696052	2672814652	39055	
		85	BLADE PER CENT	LOADING RADIUS		
		D E G	R E F S			
K	0+11201K	30+11201K	60+11201K	90+11201K		
0	2808244552	3131684752	2946533952	1862291952	47055	
1	1216522752	2281016152	3073223152	2954750352	48055	
2	2843081652	2231173152	1859576652	3285356352	49055	
		90	BLADE PER CENT	LOADING RADIUS		
		D E G	R E F S			
K	0+11201K	30+11201K	60+11201K	90+11201K		
0	2828912152	2901395952	2942863452	1896460752	57055	
1	8061234551	2053714452	3035585952	3067351252	58055	
2	3108942652	2735260852	2183893252	3674393052	59055	
		95	BLADE PER CENT	LOADING RADIUS		
		D E G	R E F S			
K	0+11201K	30+11201K	60+11201K	90+11201K		
0	2738066152	2460370552	1598752452	5881917051	67055	
1	3605182151	1847968852	2504530252	2533745052	68055	
2	2634290452	2584112052	1589857552	3223062352	69055	

BLADE 0	LOADING AZIMUTH	THRUST	PER	INCH	BLADE 270	LOADING AZIMUTH	THRUST	PER	INCH
SPAN					SPAN				
40			9202893051		40		3092022351		
55			1849616452		55		9016381451		
75			2597216152		75		1316666452		
85			2808244552		85		2231173152		
90			2828912152		90		2735280852		
95			2738066152		95		2584112052		
BLADE 30	LOADING AZIMUTH	THRUST	PER	INCH	BLADE 300	LOADING AZIMUTH	THRUST	PER	INCH
SPAN					SPAN				
40			1209079452		40		4512789951		
55			2152716252		55		7025184051		
75			2740975852		75		1436696052		
85			3131684752		85		1859576652		
90			2901395952		90		2183893252		
95			2460370552		95		1589857552		
BLADE 60	LOADING AZIMUTH	THRUST	PER	INCH	BLADE 330	LOADING AZIMUTH	THRUST	PER	INCH
SPAN					SPAN				
40			1145455252		40		7373810751		
55			1996122352		55		1510242252		
75			2394525352		75		2672814652		
85			2946533952		85		3285356352		
90			2942863452		90		3674393052		
95			1598752452		95		3223062352		
BLADE 90	LOADING AZIMUTH	THRUST	PER	INCH	BLADE 180	LOADING AZIMUTH	THRUST	PER	INCH
SPAN					SPAN				
40			1190171352		40		1440926452		
55			1796193252		55		2257775152		
75			1807622652		75		2846918452		
85			1862291952		85		3073223152		
90			1896460752		90		3035585952		
95			5881917051		95		2504530252		
BLADE 120	LOADING AZIMUTH	THRUST	PER	INCH	BLADE 210	LOADING AZIMUTH	THRUST	PER	INCH
SPAN					SPAN				
40			1125186752		40		1073246452		
55			1509999652		55		1657759452		
75			1703581752		75		2473328052		
85			1216522752		85		2954750352		
90			8061234551		90		3067351252		
95			3605182151		95		2533745052		
BLADE 150	LOADING AZIMUTH	THRUST	PER	INCH	BLADE 240	LOADING AZIMUTH	THRUST	PER	INCH
SPAN					SPAN				
40			1304602952		40		4975439051		
55			2399998452		55		1265380952		
75			2441093752		75		2172557052		
85			2281016152		85		2843081652		
90			2053714452		90		3108942652		
95			1847988852		95		2634290452		

		HARMONIC		ANALYSIS			
		40	BLADE PFR	CENT	LOADING RADIUS		
COEF	COSINE	SINE	MAX	PSI			
STEADY	9503636751						70055
1	1512047851-	3962043351	4240763651	1108885353			71055
2	2357106351	4429364750	2398362551	5321322151			72055
3	8244006350-	2465232750-	8761066050	6659427252			73055
4	1478377250	2108714250	2911414550	1487242352			74055
5	2667338550-	1462796750	3042115950	3025183552			75055
		55	BLADE PFR	CENT	LOADING RADIUS		
COEF	COSINE	SINE	MAX	PSI			
STEADY	1666663352						80055
1	1314057251-	4865087751	5039427051	1051148953			81055
2	4221510351	1370081251	4438273551	8990358251			82055
3	5523638850-	8169305050	9861446650	4135480752			83055
4	3464245750	1658076851-	1693879851	7045028452			84055
5	1743675050-	4246203350	4590277250	2246503752			85055
		75	BLADE PFR	CENT	LOADING RADIUS		
COEF	COSINE	SINE	MAX	PSI			
STEADY	2216994752						90055
1	2671753350	1553802051	1576605051	8024343352			91055
2	6050449051	2204323351	6439485551	1000894752			92055
3	3413068350-	7583806750-	8316439150	8192334052			93055
4	7489373350-	1914504751-	2055780951	6215875452			94055
5	1174374751-	1426006750	1183000851	3461533052			95055
		85	BLADE PFR	CENT	LOADING RADIUS		
COEF	COSINE	SINE	MAX	PSI			
STEADY	2541121352						100055
1	1885480051	2083151551-	2809725151	3121485453			101055
2	5302578351	4667268751	7064045251	2067693352			102055
3	1685805751-	7642056750-	1850932551	6812854452			103055
4	4738811750-	3165975051-	3201243751	6537180452			104055
5	1524562051-	5254575050-	1612574051	3980341852			105055
		90	BLADE PFR	CENT	LOADING RADIUS		
COEF	COSINE	SINE	MAX	PSI			
STEADY	2602909752						110055
1	2764997251	5115245851-	5814718451	2983930253			111055
2	4267117251	4766645351	6397573051	2408249352			112055
3	2363937851-	1579687351-	2843169751	7125086652			113055
4	2115005050	4071976051-	4077465051	6824332552			114055
5	1434423351-	6585396750-	1578367751	4093194552			115055
		95	BLADE PFR	CENT	LOADING RADIUS		
COEF	COSINE	SINE	MAX	PSI			
STEADY	2055290452						120055
1	2429567351	7802639851-	8172146951	2872954253			121055
2	6685274551	3183698851	7404649451	1273249352			122055
3	6622700049	9124555050	9148557650	2861623052			123055
4	4843440050	3405790551-	3440057851	6952346752			124055
5	1328112051-	1264504051-	1833808051	4471891552			125055

TOTAL		PLANE	THRUST
BLADE	POSITION		THRUST
	0		3697715054
	30		4100882754
	60		3710836454
	90		2431231454
	120		2420522454
	150		3793649354
	180		4139382954
	210		3684467754
	240		3042729854
	270		2251652754
	300		2015442354
	330		3732092654

6055  
306055  
606055  
906055  
1206055  
1506055  
1806055  
2106055  
2406055  
2706055  
3006055  
3306055

HARMONIC		ANALYSIS		
COEFF	COSINE	SINE	MAX	PSI
STEADY	3310033854			
1	3383521752-	3079788853	3098319153	9626949852
2	8191486053	3719593353	8796433653	1221093552
3	1507821753-	3363428352-	1544879553	6419161452
4	5038183351-	2970743353-	2971170553	6725709852
5	1362157553-	1823550051-	1362279653	3615339652

130055  
131055  
132055  
133055  
134055  
135055

PER CENT RADIUS	K	BEAM REF		BENDING ELAST		R F E S		
		O+11201K	D E G 30+11201K	R E E S 60+11201K	90+11201K			
15	0	2442500054-	1552097055-	1704170055-	1339190055-			217255
	1	1704170055-	1673750055-	2190810055-	1004625055-			218255
	2	6092300054-	4248800054-	9419350054-	1207300054-			219255
28	0	1700275054-	4129175054-	2274350054-	4040850054-			227255
	1	4217500054-	2097700054-	5719025054-	5078500053-			228255
	2	4637250053	2318550054	4085650054	2870750053			229255
36	0	1288250054	3133000054-	1561000054-	3526000054-			237255
	1	3129500054-	1561000054-	4705000054-	1168000054-			238255
	2	4935000053	1583000054	2958500054	8732500053-			239255
45	0	1440000052	2345400054-	1558800054-	3628800054-			247255
	1	2759400054-	2014200054-	3628800054-	1393200054-			248255
	2	2539800054	2415600054	2664000054	5652000053-			249255
60	0	5049920054-	2801120054-	4675120054-	5124880054-			257255
	1	3925520054-	2574640054-	4225360054-	4675120054-			258255
	2	4221600053	1659000054	1264440054-	2014040054-			259255
65	0	7033030054-	2600140054-	6333100054-	5322090054-			267255
	1	4466620054-	6488640054-	4311080054-	5516515054-			268255
	2	4614650053	1910520054	2600140054-	1861325054-			269255
80	0	6072000054-	2208600054-	7300500054-	4445950054-			277255
	1	3095825054-	6876175054-	3713025054-	6143250054-			278255
	2	1475675054-	9545500053	4947425054-	1591400054-			279255
92.5	0	4020000054-	9800000053-	3497500054-	1550000054-			287255
	1	1027500054-	3260000054-	1312500054-	2880000054-			288255
	2	6000000053-	4100000053-	2690000054-	1075000054-			289255

WM.	BEAM	BEND	.15R	K	O+11201K	D E G 30+11201K	R E E S 60+11201K	90+11201K	
				0	2094250055-	1216250055-	8101750054-	1995250054	717455
				1	9019250054	7485000053-	1736250054-	1304050055-	718455
				2	1490625055-	1117475055-	1710125055-	1622325055-	719455
WM.	BEAM	BEND	.25R	0	4843960054-	8489200053-	3163000053	2646740054	727455
				1	5143640054	6492200053	2813200054	3179360054-	728455
				2	1514760054-	2014140054-	3512260054-	1348300054-	729455

HARMONIC ANALYSIS

15	PER	CENT	RED BLADE RADIUS	BEAM	BENDING		
COEF			COSINE	SINE	MAX	PSI	
STEADY			8778958354-				290255
1			6336814054	1029148055-	1208593355	3016220253	291255
2			3396340754-	3687623554-	5013351954	1136773053	292255
3			6589421753	9631406653-	1167009354	1014601353	293255
4			4059321853	7902047853	8881671453	1570829052	294255
5			2736990054	5079673353	2763732354	2102899151	295255
28	PER	CENT	RADIUS				
COEF			COSINE	SINE	MAX	PSI	
STEADY			1177647954-				300255
1			1521775254	3153965554-	3501917254	2957569653	301255
2			7581226053-	6501795853-	4987403953	1103084953	302255
3			3091377553	5888376252	3146958053	3594788851	303255
4			2576146053-	1657319553-	3063206853	5318862952	304255
5			1878736354	3316887752	1879025154	2022890950	305255
36	PER	CENT	RADIUS				
COEF			COSINE	SINE	MAX	PSI	
STEADY			1086125054-				310255
1			1125644554	2348867554-	2604660154	2956050753	311255
2			7286870853-	2778046053-	7871927653	1011145953	312255
3			3766251753	4093753253	5562485253	1579531852	313255
4			2538124253-	2410798053-	3500574553	5588155652	314255
5			1494354854	2077426253	1508180254	1552784651	315255
45	PER	CENT	RADIUS				
COEF			COSINE	SINE	MAX	PSI	
STEADY			8550000053-				320255
1			7893064553	2581882354-	2699837254	2869989153	321255
2			1000499654-	1195121352-	1000570954	9034219352	322255
3			3864002653	6072002653	7197203153	1717626752	323255
4			1519001053-	3226609753-	4774481053	5562995452	324255
5			6498426053	1668824353	6671036453	2897392451	325255

		HARMONIC		ANALYSIS	
60	PER CENT	RED. BLAD. RADIUS	BEAM	BENDING	
COEF		COSINE	SINE	MAX	PSI
STEADY		3104083354-			330255
1		4439732553	2391019854-	2431889854	331255
2		1436732754-	1514736253	1444625554	332255
3		2686068353	8435465353	909984453	333255
4		8120726754-	1190150753-	1440605653	334255
5		1124661154-	1513740753-	1137000754	335255

65	PER CENT	RADIUS			
COEF		COSINE	SINE	MAX	PSI
STEADY		3756968854-			340255
1		3014163353	2464914754-	2463275354	341255
2		1539197454-	7296338352	1540925854	342255
3		2138677053	9202760753	9448021653	343255
4		6804789752	5612666751-	6827877452	344255
5		1876260354-	2311129553-	1890440754	345255

60	PER CENT	RADIUS			
COEF		COSINE	SINE	MAX	PSI
STEADY		4376772954-			350255
1		3546870052-	1586079754-	1586478754	351255
2		1382270554-	8908503352-	1385138254	352255
3		5529084353	6750619853	8725917853	353255
4		2571655353	1224919553	2848460153	354255
5		2696908554-	4341085053-	2732422354	355255

92.5	PER CENT	RADIUS			
COEF		COSINE	SINE	MAX	PSI
STEADY		1941875054-			360255
1		2416310853-	3920070753-	4604944353	361255
2		5937498253-	1371215352	5939081353	362255
3		3087499553	1424997253	3400480853	363255
4		1187494653	1234085653	1712632753	364255
5		1420869354-	3549335252-	1421312654	365255

		HARMONIC		ANALYSIS	
WH.	BEAM BEND .15R	COSINE	SINE	MAX	PSI
COEF		8760250054-			750455
STEADY		6917566254-	8310042554	1081247155	751455
1		3173603754-	3342460854-	4609100154	752455
2		1829050052	5304565053	5307717453	753455
3		7956877753	9663025053	1251742654	754455
4		2703849354-	1194566354-	2955963354	755455

WH.	BEAM BEND .35R	COSINE	SINE	MAX	PSI
COEF		4741850053-			760455
STEADY		1796879054-	2651142054	3202706454	761455
1		8739151553-	8889778253-	1246599154	762455
2		1367165453-	5548632052-	1494021653	763455
3		1248450953	7207907052-	1443585553	764455
4		1892984054-	3761889753-	1930001754	765455

PER CENT RADIUS	K	CHORD RED		BENDING BLADE		R E E S		90+11201K
		O+11201K	D E G	30+11201K	60+11201K			
15	0	8893500055	7546000055	4312000055	3234000055			67155
	1	9432500054	8085000054	3907750055	5120500055			68155
	2	8354500055	9432500055	1064525056	1266650056			69155
28	0	7684275055	6712700055	4239600055	3974625055			77155
	1	1059900055	1766500055	3621350055	4769550055			78155
	2	7242650055	8302550055	9185800055	1086397556			79155
60	0	4167977555	3269905055	2233667555	2717245055			87155
	1	9441275054	2118530055	2533025055	2878437555			88155
	2	3039630055	3292932555	3868620055	5043022555			89155
80	0	2539890055	2351750055	1928435055	2257680055			97155
	1	1387532555	1998987555	2093057555	2281197555			98155
	2	2257680055	2257680055	2539890055	3080792555			99155
WH. CHORD BEND .15R	0	4482940055	4920300055	8419180055	9840600055			737455
	1	1027796056	1312080056	9184560055	7872480055			738455
	2	4810960055	2296140055	1968120055	1093400054-			739455
WH. CHORD BEND .28R	0	4463070055	5038950055	6838575055	8494230055			747455
	1	8278275055	1108569056	7918350055	6910560055			748455
	2	4966965055	3311310055	2447490055	1223745055			749455

# HARMONIC ANALYSIS

COEF STEADY	15 PER CENT	RED BLADE RADIUS	CHORD		BENDING		PSI
			COSINE	SINE	MAX		
1		6322020855					100155
2		3364228355	3802972255-	5077462955	3114969853		101155
3		1796659854	3889883353	1838286854	6108175951		102155
4		1122906754-	5389988354-	5505714754	8607726152		103155
5		4491626753	2722918354-	2759715854	6984174052		104155
		7590260054-	1647229554	7767295354	3355123452		105155

COEF STEADY	28 PER CENT	RADIUS	CHORD		BENDING		PSI
			COSINE	SINE	MAX		
1		5785287555					110155
2		2697639055	2923839555-	3978202455	3126957553		111155
3		3680123353	1274858353	3894685153	9553485251		112155
4		1766491354-	4710656754-	5030981954	8314800352		113155
5		1104059554	3442117854-	3614847454	7194591652		114155
		4895139754-	2888113254	5683624854	2989191352		115155

COEF STEADY	60 PER CENT	RADIUS	CHORD		BENDING		PSI
			COSINE	SINE	MAX		
1		3008926855					120155
2		9276537354	8454778054-	1255139155	3176534853		121155
3		3837912054	7976966753-	3919934854	1741292353		122155
4		8059590053-	3262225254-	3360310054	8537417352		123155
5		1688682354	2127185554-	2715983454	7711114252		124155
		2958101753-	2314116354	2332946254	1945690852		125155

COEF STEADY	80 PER CENT	RADIUS	CHORD		BENDING		PSI
			COSINE	SINE	MAX		
1		2247881355					130155
2		3093932354	2981216854-	4296518554	3160629253		131155
3		1528634254	2715570053-	1552567554	1749633453		132155
4		6271310053-	1685418254-	1798312554	8319672152		133155
5		3919590053	1018335554-	1091164154	7276295352		134155
		2326335053-	1295799854	1316516454	2003556752		135155

# HARMONIC ANALYSIS

COEF STEADY	WH. CHORD BEND .15R	COSINE	SINE	MAX	PSI	
1		6423725055				770455
2		3511121255-	3834131355	5198897555	1324820253	771455
3		2824608254	1104732954	3032960054	1068048652	772455
4		2333333348	4555835354	4555835354	2999999052	773455
5		2733645053	1736004554-	1757395754	6973718652	774455
		1160313955	3936832054	1225281555	3748314951	775455

COEF STEADY	WH. CHORD BEND .28R	COSINE	SINE	MAX	PSI	
1		5914767555				780455
2		2599403855-	2641426855	3705946055	1345406053	781455
3		2399493054	1039015254	2614788654	1170665552	782455
4		8398285053	4679027554	4753799554	2660815052	783455
5		1319736054	2078025554-	2461685054	7560481852	784455
		7877832754	4179366054	8917810754	5589389951	785455

				D E G (120)K 30+(120)K	R E E S 60+(120)K	90+(120)K	
R/B	TORS	.15R	0	6795580054-	4324460054-	6177800054-	487355
			1	4633350054-	7722250054-	5251130054-	488355
			2	1235560054-	6177800053	1853360054-	489355

R/B	TORS	.50R	0	2130240054-	1065120054-	3119280054-	497355
			1	9890400053-	1749840054-	1597680054-	498355
			2	3043200053-	4184400053	3043200053	499355

HARMONIC ANALYSIS

R/B	TORS		COSINE	SINE	MAX	PSI	
COEF			4453164254-				560355
STEADY			7942701553-	1712391554-	1905792654	2453694153	561355
1			2445377754-	1203779854	2725611554	7689524552	562355
2			1029634053	7722248053	7790517953	2746845152	563355
3			7464845353	1471285954	1649824754	1577454752	564355
4			8091903352-	4968302553	5033767953	1985011552	565355
5							

R/B	TORS		COSINE	SINE	MAX	PSI	
COEF			1233130054-				570355
STEADY			3253722053-	1068485154-	1116927754	2530636153	571355
1			4120997353-	8784956752-	4213594053	9601696752	572355
2			1648400553	3613800353	3971999153	2182678352	573355
3			1458199253-	7027969353	7177652653	2543042752	574355
4			1057481753-	1174847853	1580675553	2639808352	575355
5							



TYPE		STATE	DATA			
			0	1	2	3
RED BLADE	PITCH	0	00000000	00000000	00000000	00000000
		1	1124705000	1124705000	1124705000	1124705000
		2	2289405000	2289405000	2289405000	2289405000
RED BLADE	FLAP	0	2447200000	2447200000	2447200000	2447200000
		1	3617600000	3617600000	3617600000	3617600000
		2	4889600000	4889600000	4889600000	4889600000
VERTICAL	ACCEL	0	9056000000	9056000000	9056000000	9056000000
		1	1082215000	1082215000	1082215000	1082215000
		2	9177050000	9177050000	9177050000	9177050000
FORE-AFT	ACCEL	0	1074550000	1074550000	1074550000	1074550000
		1	5749000000	5749000000	5749000000	5749000000
		2	9915000000	9915000000	9915000000	9915000000
LATERAL	ACCEL	0	7436600000	7436600000	7436600000	7436600000
		1	2029000000	2029000000	2029000000	2029000000
		2	1149200000	1149200000	1149200000	1149200000

# HARMONIC ANALYSIS

RED BLADE		PITCH	COEF	COSINE	SINE	MAX	PSI	
			STEADY	1837113352				910555
			1	2141547200	8870159000	7196201000	2873131653	911555
			2	3396016740	2289405000	2294766500	1392762400	912555
			3	3202896350	4053103340	3239488000	5712793950	913555
			4	2607106150	2245000000	2624707300	4977654150	914555
			5	1615556350	1127400000	1619487200	3679837252	915555

RED BLADE		FLAP	COEF	COSINE	SINE	MAX	PSI	
			STEADY	1041833351				920555
			1	3000770000	2260512000	3270271100	1554050000	921555
			2	4433216740	1171010000	1172660000	4309771850	922555
			3	2037333500	1773331700	2702514000	4633031500	923555
			4	2216706740	7670733340	2345916540	4776556800	924555
			5	1574061850	3241448340	3609446100	3496992850	925555

VERTICAL		ACCEL	COEF	COSINE	SINE	MAX	PSI	
			STEADY	9847750000				930555
			1	1400247000	6021701740	1531576740	2031523953	931555
			2	0373070340	1089000000	2067071640	1770511750	932555
			3	5502400000	5582615000	1074057000	4499563650	933555
			4	5100164340	7691308340	2220031140	3008734750	934555
			5	1053016000	5147971740	1171896000	6679300500	935555

FORE-AFT		ACCEL	COEF	COSINE	SINE	MAX	PSI	
			STEADY	6417208340				940555
			1	2003260540	3294413340	2003540940	1790940353	941555
			2	3552076540	0021610740	7671370440	3124414850	942555
			3	2203353340	1371004240	1394797040	0090988350	943555
			4	6472291240	2520208740	6940702440	2960569150	944555
			5	1751365040	2532772240	3079320440	4706737350	945555

LATERAL		ACCEL	COEF	COSINE	SINE	MAX	PSI	
			STEADY	9295000000				950555
			1	3153576740	0278391040	0021540040	1109463753	951555
			2	1307749950	2292947440	1329004550	1750350053	952555
			3	6759961740	3943345340	7020067040	1099144853	953555
			4	2112496640	5123000040	2304100040	1075777250	954555
			5	2264300340	5471700540	2420454740	5522170450	955555

		STEADY	STATE	DATA	
				D E G	R E S
				0+11201K	40+11201K
LIFT, LINK	LOAD	X	0+11201K	40+11201K	60+11201K
		0	4250025054	4703361054	4023357054
		1	5978368554	5383365054	4080024054
		2	4193358054	5326678054	6091702554
RT. CYCLIC	LOAD	0	6240000052	3128000053	4477000053
		1	3120000052	4160000052	2080000052
		2	3846000053	2912000053	3120000052
LT. CYCLIC	LOAD	0	2707200053	1353600053	9024000052
		1	1128000052	2256000053	2030400053
		2	6768000052	2481600053	5640000052
COLLECTIVE	LOAD	0	1091200053	1984000052	2976000052
		1	3968000052	1785600053	2976000052
		2	3968000052	3968000052	1785600053
STABILIZER	BAR	0	1861200051	6204000050	3102000051
		1	3515600051	2068000051	3102000050
		2	5325100051	7031200051	5945500051

# HARMONIC ANALYSIS

LIFT LINK	LOAD	COEF	COSINE	SINE	MAX	PSI	
STEADY			4979612854				1080655
1			5015866751	1043679851	1094629453	2673741353	1081655
2			3281972253	7238571353	7947646053	1228052253	1082655
3			3777855052	5194411752	6422935552	1020093753	1083655
4			2762511553	3885114253	4767135653	1135368652	1084655
5			5223925052	2757650052	5407116652	6643418852	1085655

RT. CYCLIC	LOAD	COEF	COSINE	SINE	MAX	PSI	
STEADY			1646666753				1090655
1			2322393550	4673354051	4679121051	9284494152	1091655
2			1187333153	1936432853	2271460353	6075737352	1092655
3			1733330352	2773333752	3270445552	4066844652	1093655
4			5806664752	2852109052	6469101052	5153582252	1094655
5			3234398551	1333995552	1372646152	5127422052	1095655

LT. CYCLIC	LOAD	COEF	COSINE	SINE	MAX	PSI	
STEADY			2444000052				1100655
1			5873805051	6143726751	84998271451	1137133253	1101655
2			9211993552	6184886352	1109677453	7305711052	1102655
3			2600000046	3008000752	3008000752	2999996352	1103655
4			2124000553	3581860752	2154385353	2392609251	1104655
5			3971381052	1265620252	4168172552	3535261851	1105655

COLLECTIVE	LOAD	COEF	COSINE	SINE	MAX	PSI	
STEADY			9093333351				1110655
1			2187698252	1256214452	2522716452	2096652053	1111655
2			5042663752	4725035552	6910457152	1584312553	1112655
3			3141333752	3306666751	3156689352	5799700052	1113655
4			5869335352	3865937352	7028126952	5334289552	1114655
5			1614969252	3971166251	1663077652	3876295952	1115655

STABILIZER	BAR	COEF	COSINE	SINE	MAX	PSI	
STEADY			1202025051				1120655
1			7550897850	5386664051	5439329951	9797954452	1121655
2			1292520049	2238681349	2585016649	2999985052	1122655
3			8616740049	1809506250	2004194350	8151217952	1123655
4			3877550049	3711181749	5381181249	7902551452	1124655
5			6575776749	2227858350	2322877750	1471108752	1125655

		STEADY	STATE	DATA		
				D E G	R E E S	
				30+(120)K	60+(120)K	90+(120)K
R F	PYLON	K	0+(120)K	30+(120)K	60+(120)K	90+(120)K
		0	1622500049	6195000049	1180000050	8555000049
		1	4277500049	2507500049	2802500049	7080000049
		2	1386500050	7965000049	4425000049	3835000049
R A	PYLON	0	1140000050	1695000050	1500000050	1005000050
		1	7200000049	7050000049	1275000050	1785000050
		2	1545000050	9900000049	6450000049	7250000049
L F	PYLON	0	1500000049	4650000049	8700000049	2550000049
		1	1800000049	6900000049	2100000049	6300000049
		2	1050000050	3300000049	2250000049	7650000049
L A	PYLON	0	1067500050	7015000049	1372500049	2440000049
		1	5642500049	1464000050	1006500050	6100000049
		2	3507500049	1525000048	5490000049	1479250050
		HARMONIC		ANALYSIS		
R F	PYLON	COEF	COSINE	SINE	MAX	PSI
		STEADY	5187083349			
		1	6758061348	1841379548	7004432348	1952414853
		2	4302082249	5279868849	6810645049	6458672552
		3	1229175048	2458286747	1253516248	1162301253
		4	4916783347	3832169248	3863782448	2067218352
		5	3710913347	4545556248	4560678748	1893343652
R A	PYLON	COEF	COSINE	SINE	MAX	PSI
		STEADY	1127500050			
		1	7147120248	1433027548	7289368648	1686623053
		2	4499995848	5672466849	5751467649	4024629552
		3	2499896747	1250006848	1274759548	3376980852
		4	2499987848	8227250548	8598697048	2672557252
		5	6471398347	5669941747	8603908147	8244670851
L F	PYLON	COEF	COSINE	SINE	MAX	PSI
		STEADY	1750000049			
		1	6339111248	3948555548	7468794548	3191827852
		2	1937498349	7036456749	7298330249	1426974953
		3	2750003548	2500023347	2761344048	5826851352
		4	6125005848	3247596748	6932718148	5198335152
		5	5691158347	5144283346	5913576247	3500189552
L A	PYLON	COEF	COSINE	SINE	MAX	PSI
		STEADY	6011041749			
		1	4209561748	7749645048	8819150148	6148944752
		2	6049164049	4666433849	7639894649	1611763853
		3	2287499848	2541661748	3419459048	7600424452
		4	1779170048	4402250047	1832824048	4847443252
		5	1127945048	1146197548	1608113448	9091970551
				D E G	R E E S	
				30+(120)K	60+(120)K	90+(120)K
RED	PITCH LINK	0	1392500052	1114000053	1671000053	1392500052
		1	4177500052	5570000052	1671000053	2367250053
		2	4734500053	2785000053	1392500053	7101750053
WHITE	PITCH LINK	0	2916000052	1603600053	2770200053	1603800053
		1	2041200053	5248600053	1458000052	2770200053
		2	3061800053	2916000053		2916000052
		HARMONIC		ANALYSIS		
RED	PITCH LINK	COEF	COSINE	SINE	MAX	PSI
		STEADY	3481250051			
		1	1597983253	1297330753	2058304453	2190716053
		2	1636186653	1467227853	2197695253	6905814052
		3	1206833653	9979584852	1566004053	1319604352
		4	3133134352	1105445453	1148988653	1854395652
		5	1296275253	8331639552	1540938553	6546070951
WHITE	PITCH LINK	COEF	COSINE	SINE	MAX	PSI
		STEADY	5589000052			
		1	1638442853	1841098353	2464576653	4833325352
		2	5588998052	2946218752	6317998452	7610211152
		3	6561003052	8505000052	1074159253	7745074152
		4	1215001852	9680431252	9756381352	2071151852
		5	1055242753	4316989252	1140132153	4044988752

IBM TAB NO. 7  
TYPE I STEADY STATE CONDITION NO. 58  
HIGH ALTITUDE, BELOW STALL THRESHOLD  
TRUE AIRSPEED 79 KNOTS

PER CENT CHORD	K	40		DELTA PER CENT		PRESSURE RADIUS	
		0+11201K	D E G	30+11201K	R E E S	60+11201K	90+11201K
4	0	2298395051	2701930051	2772110051	3017740051	17158	
	1	2947560051	2772110051	2035220051	1017610051	18158	
	2	3684450050	3614400050	9474300050	1543960051	19158	
17	0	1108980051	1290760051	1318050051	1472580051	27158	
	1	1508940051	1408950051	1218060051	1090800051	28158	
	2	2454300050	3181500050	5635800050	8726400050	29158	
34	0	6600000050	7560000050	7680000050	8460000050	37158	
	1	8460000050	8160000050	7020000050	8580000050	38158	
	2	3000000050	1920000050	3120000050	4980000050	39158	
61	0	2655950050	3116900050	2919350050	3248600050	47158	
	1	3468100050	3180300050	3402250050	4060750050	48158	
	2	2107200050	8780000049	1295050050	1975500050	49158	
88	0	1035150050	1158750050	1066050050	1205100050	57158	
	1	1359600050	1421400050	1591350050	2101200050	58158	
	2	2054850050	1467750050	6489000049	1019700050	59158	

PER CENT CHORD	K	55		DELTA PER CENT		PRESSURE RADIUS	
		0+11201K	D E G	30+11201K	R E E S	60+11201K	90+11201K
2	0	5068800051	5022720051	4469760051	4285440051	147258	
	1	3847680051	6635520051	6312960051	4654080051	148258	
	2	3041280051	1728000051	2764800051	4055040051	149258	
9	0	3590550051	3772350051	3545100051	3590550051	157258	
	1	3272400051	4545000051	4045050051	3317850051	158258	
	2	2454300051	1568025051	2117950051	3022425051	159258	
17	0	2105400051	2210670051	2175580051	2210670051	167258	
	1	1965040051	2772110051	2456300051	1894860051	168258	
	2	1210605051	7018000050	1157970051	1684320051	169258	
23	0	1706880051	1760220051	1706880051	1671320051	177258	
	1	1493540051	2204720051	1920240051	1529080051	178258	
	2	9245600050	5334000050	9245600050	1315720051	179258	
34	0	1372800051	1465200051	1438800051	1432200051	187258	
	1	1320000051	1808400051	1557600051	1181400051	188258	
	2	8844000050	4554000050	7788000050	1089000051	189258	
63	0	4721200050	4924700050	4721200050	4721200050	197258	
	1	4741550050	6410250050	5392750050	4029300050	198258	
	2	3968250050	2849000050	2523400050	3886650050	199258	
90	0	8277000049	9078000049	9078000049	1041300050	207258	
	1	1068000050	1308100050	1228200050	1094700050	208258	
	2	1388400050	9078000049	4405500049	8544000049	209258	

PER CENT CHORD	K	75		DELTA PER CENT		PRESSURE RADIUS	
		0+11201K	D E G	30+11201K	R E E S	60+11201K	90+11201K
2	0	7948145051	6603800051	5188700051	4764170051	377358	
	1	5518890051	6226440051	7075500051	7547200051	378358	
	2	8018900051	7547200051	6650970051	8443430051	379358	
9	0	5783505051	6355500051	4237000051	3770930051	387358	
	1	4787810051	5253880051	4575960051	4067520051	388358	
	2	3940410051	3516710051	3516710051	4533590051	389358	
17	0	2897820051	2642130051	2429055051	2613720051	397358	
	1	3181920051	2500060051	2727360051	2585310051	398358	
	2	2386440051	2159160051	2130750051	2784180051	399358	
23	0	2824190051	2850100051	2668730051	2591000051	407358	
	1	2513270051	2746460051	2772370051	2513270051	408358	
	2	2780080051	1891430051	2046890051	2642820051	409358	
34	0	1818240051	1704600051	1363680051	1306860051	417358	
	1	1519935051	1690395051	1761420051	1534140051	418358	
	2	1377885051	1136400051	1250040051	1661985051	419358	
63	0	6506150050	6602300050	5063900050	4871600050	427358	
	1	6089500050	7307400050	7563800050	6794600050	428358	
	2	5672850050	6281800050	4711350050	6922800050	429358	
90	0	1171500050	1011750050	7100030049	5857500049	437358	
	1	1118250050	1739500050	1775000050	1739500050	438358	
	2	2272000050	3532250050	1242500050	2325250050	439358	

PER CENT CHORD	K	DELTA PER CENT		PRESSURE RADIUS		
		0+11201K	30+11201K	60+11201K	90+11201K	
2	0	8050030051	6390230051	4315480051	4149500051	607458
	1	3900530051	5103885051	7137140051	7635080051	608458
	2	8216010051	6888170051	7718070051	9087405051	609458
4	0	8666775051	6666750051	4222275051	4000050051	617458
	1	4000050051	5422290051	7466760051	8088990051	618458
	2	8088990051	6488970051	7466760051	9289005051	619458
9	0	7876350051	5890140051	3766550051	3698460051	627458
	1	3561480051	4588830051	6780910051	4862790051	628458
	2	4999770051	5547670051	4588830051	7362675051	629458
13	0	7060750051	5139300051	3264150051	3379900051	637458
	1	3241000051	4213300051	5000400051	3657700051	638458
	2	3657700051	4143850051	3379900051	5185600051	639458
17	0	5098080051	5637300051	4166700051	4166700051	647458
	1	4215720051	5098080051	4019640051	3872580051	648458
	2	3872580051	3627480051	3529440051	4509840051	649458
23	0					657458
	1					658458
	2					659458
34	0	1899225051	1734075051	1642325051	2605700051	667458
	1	1192750051	1554750051	1890050051	1853350051	668458
	2	1770775051	1679025051	1578100051	2128600051	669458
47.7	0					677458
	1					678458
	2					679458
63	0	6997200050	5426400050	2046800050	2475200050	687458
	1	2856000050	5236000050	7235200050	7425600050	688458
	2	7330400050	7425600050	5854800050	8234800050	689458
77	0	2085600050	7584000049	1232400050	1137600050	697458
	1	3792000049	1422000050	2844000050	3555000050	698458
	2	3839400050	4455600050	3686800050	3934200050	699458
90	0	9430000049	2829000049	1603100050	1603100050	707458
	1	1225900050	1414500049	1037300050	1461650050	708458
	2	2263200050	3111900050	3111900050	2593250050	709458

PER CENT CHORD	K	90		DELTA PER CENT		PRESSURE RADIUS	
		0+11201K	D E G	30+11201K	R E E S	60+11201K	90+11201K
2	0	5365070051	7460310051	4867720051	4761900051	797558	
	1	4021160051	5343910051	7619040051	8465600051	798558	
	2	9312160051	9629620051	8994700051	1021163052	799558	
9	0	7419685051	5484115051	3041610051	2857270051	807558	
	1	2396420051	3364205051	5299775051	6313645051	808558	
	2	5714540051	5806710051	4055480051	7557940051	809558	
17	0	5917000051	4911110051	3431860051	3668540051	817558	
	1	3076840051	4378580051	5561980051	3786880051	818558	
	2	3905220051	3905220051	3313520051	4260240051	819558	
23	0	4215720051	6029460051	5000040051	4902000051	827558	
	1	4656900051	5196120051	3039240051	2843160051	828558	
	2	2990220051	3063750051	2401980051	3431400051	829558	
34	0	1796440051	1629760051	2740960051	4111440051	837558	
	1	1481600051	8889600050	1444560051	1703840051	838558	
	2	1777920051	1777920051	1148240051	2000160051	839558	
63	0	5431800050	3292000050		8230000048	847558	
	1	1316800050	4444200050	6090200050	6748600050	848558	
	2	7242400050	6913200050	4115000050	7407000050	849558	
90	0	1725750050-	3672750050-	5044500050-	4602000050-	857558	
	1	3230250050-	9735000049-	4425000049	1106250050	858558	
	2	1460250050	2920500050	2876250050	1371750050	859558	

PER CENT CHORD	K	95		DELTA PER CENT		PRESSURE RADIUS	
		0+11201K	D E G	30+11201K	R E E S	60+11201K	90+11201K
2	0	7307400051	4615200051	2884500051	2788350051	967658	
	1	2211450051	3653700051	5576700051	6345900051	968658	
	2	7788150051	8268900051	7884300051	8509275051	969658	
9	0	6650455051	3923290051	2248715051	2296560051	977658	
	1	2009490051	3253460051	4784500051	4880190051	978658	
	2	5167260051	6028470051	5262950051	7846580051	979658	
17	0	6157710051	3894620051	2631500051	2526240051	987658	
	1	2210460051	3473580051	4631440051	3263060051	988658	
	2	3263060051	3473580051	3263060051	4736700051	989658	
23	0	4072450051	5103450051	3196100051	3041450051	997658	
	1	3093000051	4330200051	2139325051	2216650051	998658	
	2	2319750051	2525950051	2216650051	3041450051	999658	
34	0					1007658	
	1					1008658	
	2					1009658	
63	0	4194000050	1607700050	9786000049-		1017658	
	1	1817400050	4333800050	6011400050	6710400050	1018658	
	2	7129800050	6710400050	2865900050	5731800050	1019658	
90	0	5655000049-	5220000049-	7177500049-	6090000049-	1027658	
	1	1087500049	4785000049	7395000049	7830000049	1028658	
	2	8047500049	7177500049	8700000048	2610000049-	1029658	

K	U+ 120 K	BLADE PER CENT	LOADING RADIUS		90+ 120 K
		D E G	R E S	60+ 120 K	
0	9067860951	1055215852	1060222952	1164383552	17058
1	1180144052	1126270652	9559197851	8881804151	18058
2	3726161651	2915040851	4211172351	6674753951	19058
K	U+ 120 K	BLADE PER CENT	LOADING RADIUS		90+ 120 K
		D E G	R E S	60+ 120 K	
0	1837758652	1915040052	1824354852	1821855252	27058
1	1678726452	2408692152	2136716352	1653267052	28058
2	1229993752	7411565951	1053810552	1493973252	29058
K	U+ 120 K	BLADE PER CENT	LOADING RADIUS		90+ 120 K
		D E G	R E S	60+ 120 K	
0	2707601052	2623852752	2039077252	1940105452	37058
1	2323679152	2492628852	2531022652	2354603652	38058
2	2242080652	2099620552	1932806952	2568659152	39058
K	U+ 120 K	BLADE PER CENT	LOADING RADIUS		90+ 120 K
		D E G	R E S	60+ 120 K	
0	3438203752	2908928752	2014053352	2361802452	47058
1	1870926852	2527433052	3002426652	2832738652	48058
2	2852141652	2756611452	2610963252	3467694352	49058
K	U+ 120 K	BLADE PER CENT	LOADING RADIUS		90+ 120 K
		D E G	R E S	60+ 120 K	
0	3314708752	2727268252	2145300252	2583789852	57058
1	1673212552	2116974852	2808156852	2891948452	58058
2	2957216452	3023474952	2312102052	3390904452	59058
K	U+ 120 K	BLADE PER CENT	LOADING RADIUS		90+ 120 K
		D E G	R E S	60+ 120 K	
0	3027264652	2228777752	1240703752	1273760552	67058
1	1321338052	2124301452	2337518052	2295697452	68058
2	2474043052	2640138352	2150405452	3022549852	69058



BLADE ID	LOADING AZIMUTH	THRUST	PER	INCH	BLADE ID	LOADING AZIMUTH	THRUST	PER	INCH
SPAN					SPAN				
40			9067860751		40		9557197851		
55			1837758652		55		2136716352		
75			2707601052		75		2531022652		
85			3438203752		85		3007426652		
90			3334708752		90		2808156852		
95			3027264652		95		2337518052		
BLADE 30	LOADING AZIMUTH				BLADE 210	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			1055215852		40		8881804151		
55			1915040052		55		1653267052		
75			2623852752		75		2354603652		
85			2408728752		85		2832738652		
90			2727268252		90		2891748452		
95			2228779752		95		2245697452		
BLADE 60	LOADING AZIMUTH				BLADE 240	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			1060222952		40		3726161651		
55			1824354852		55		1224993752		
75			2034077252		75		2242080652		
85			2014053352		85		2852741652		
90			2145300252		90		2957216452		
95			1240703752		95		2474043052		
BLADE 90	LOADING AZIMUTH				BLADE 270	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			1168383852		40		2915040851		
55			1821855252		55		7411565951		
75			1940105452		75		2099620552		
85			2361802452		85		2756611452		
90			2583789852		90		3023474952		
95			1273760552		95		2640138352		
BLADE 120	LOADING AZIMUTH				BLADE 300	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			1180144052		40		4211172951		
55			1678726452		55		1053810552		
75			2323679152		75		1932806952		
85			1870426852		85		2610963252		
90			1673212552		90		2312102052		
95			1321338052		95		2150405452		
BLADE 150	LOADING AZIMUTH				BLADE 330	LOADING AZIMUTH			
SPAN		THRUST	PER	INCH	SPAN		THRUST	PER	INCH
40			1126220652		40		6674753951		
55			2408692152		55		1493973252		
75			2492628852		75		2568659152		
85			2527433052		85		3467644352		
90			2116974852		90		3390904452		
95			2124301452		95		3022549852		

		HARMONIC		ANALYSIS		
		40		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	8411488351					70058
1	5624523050-	4070986351	4109657251	9786625752		71058
2	1257188551	2702270049-	1257478951	1793843353		72058
3	1714408349	4184980850-	4201432150	9169067752		73058
4	1050031750-	4591707250	4710238050	2572023052		74058
5	2796426750	1050449550-	2987354550	6788092952		75058
		55		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	1649612152					80058
1	1466170751-	4541450851	4772256551	1078922653		81058
2	3755842051	1810966749-	3755885651	1798618753		82058
3	4473173350-	1596566750	4749746750	5345276552		83058
4	1524022550-	9470983350-	9592818650	6521465852		84058
5	4187243350	1021700251	1104174551	1354293252		85058
		75		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2321311652					90058
1	2977691750	1663250050	3410725650	2918642752		91058
2	3249909351	8394616749-	3250993251	1792601853		92058
3	1284092251	5878918350	1412271151	8199859251		93058
4	1723966749-	1551655050-	1561202750	6591504252		94058
5	6989630050-	3760070050-	7936816450	4165560552		95058
		85		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2720327052					100058
1	2111706251	3655897851-	4221953651	3000114453		101058
2	4194281351	1888583350	4198531151	1289074451		102058
3	8897178350	7821010050-	1184601151	1062277153		103058
4	1694340851	9205315050-	1928255451	8287121852		104058
5	8225315050-	8997533350	1217062851	2648655252		105058
		90		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2662088152					110058
1	2301127051	4025704551-	4636969251	2997526653		111058
2	2558718051	1773244051	3113106551	1736137652		112058
3	1132634251	1664872051-	2013618451	1014093353		113058
4	2704444251	1451837851-	3069503451	8294289552		114058
5	9009953350-	1624088350	9155158250	3395637752		115058
		95		BLADE PER CENT	LOADING RADIUS	
COEF	COSINE	SINE	MAX	PSI		
STEADY	2178041652					120058
1	2017606551	6058426551-	6381973451	2883764753		121058
2	4488834551	5475745050-	4522109451	1765225553		122058
3	1823367051	6686885050	1942115251	6713214851		123058
4	1416286851	1249062551-	1888392351	7964751152		124058
5	3872358350-	1047728350-	4011594950	3902796052		125058

TOTAL		BLADE	THRUST
BLADE	POSITION	THRUST	
	0	3953381054	6058
	30	3757558454	306058
	60	3106652754	606058
	90	3260694954	906058
	120	3143072154	1206058
	150	3805655054	1506058
	180	3807465454	1806058
	210	3448113354	2106058
	240	2940947154	2406058
	270	2624220954	2706058
	300	2592411254	3006058
	330	3614746054	3306058

HARMONIC		ANALYSIS			
COEF	COSINE	SINE	MAX	PSI	
STEADY	3337915254				130058
1	9340283351	2511701054	2513437153	8787031552	131058
2	5495745553	1406531752	5497545153	7330283450	132058
3	8847875052	2269721752	9134353852	1152041053	133058
4	7352673352	7603470052	1057707753	7850982952	134058
5	2486030052	4437255052	5086214452	2385206152	135058

PER CENT RADIUS	K	BEAM RED		BENDING BLADE		R E E S		90+11201K	
		O+11201K	D E G	30+11201K	60+11201K				
15	0	6092300054-	1339190055-	1339190055-	1521680055-	217258			
	1	1947490055-	1947490055-	1825830055-	1217530055-	218258			
	2	9133800054-	1834200054-	9217500053-	5484000054-	219258			
28	0	1545500053-	2097700054-	1037800054-	4040850054-	227258			
	1	3334250054-	2627650054-	3069275054-	6622500052-	228258			
	2	5078500053-	3025150054	1700275054	7287000053	229258			
36	0	7750000053-	1757500054-	7750000053-	3526000054-	237258			
	1	2445250054-	1561000054-	2347000054-	1100000052	238258			
	2	1100000052	2958500054	6005000053	1092500053	239258			
45	0	1144800054-	1186200054-	7308000053-	3380400054-	247258			
	1	1558800054-	1393200054-	2097000054-	1440000052	248258			
	2	1256400054	3409200054	1173600054	1440000052	249258			
60	0	4300320054-	2388840054-	3588200054-	4375280054-	257258			
	1	4450240054-	5049920054-	3925520054-	3775600054-	258258			
	2	2760000052-	6470400053	1972800053	2613720054-	259258			
65	0	5322090054-	2405715054-	4738815054-	4311080054-	267258			
	1	5788710054-	5399860054-	4077770054-	4699930054-	268258			
	2	1892700053-	2281550053-	5106600053	3766690054-	269258			
80	0	6606150054-	3057250054-	5680350054-	3250125054-	277258			
	1	5757500054-	4677400054-	3983050054-	6336125054-	278258			
	2	8199000053-	3867325054-	2027000053-	5448900054-	279258			
92.5	0	3545000054-	1740000054-	2880000054-	1740000054-	287258			
	1	2275000054-	1835000054-	1645000054-	3165000054-	288258			
	2	6950000053-	2832500054-	5050000053-	3450000054-	289258			

WH.	BEAM	BEND	.15R	K	O+11201K	D E G	R E E S	90+11201K	
				0	1743050055-	1282100055-	9418750054-	2285000054-	717458
				1	1846000054-	6675000054-	6565250054-	1369900053-	718458
				2	1238200055-	1435750055-	1633300055-	1721100055-	719458
WH.	BEAM	BEND	.25R	0	1847700054-	6492200053	1498400053	3479040054	727458
				1	2147360054	1315060054	3163000053	1015380054-	782458
				2	3495400053-	2846440054-	2180600054-	1514760054-	729458

# HARMONIC ANALYSIS

15	PER CENT	RED BLADE RADIUS	BEAM	BENDING		
COEF		COSINE	SINE	MAX	PSI	
STEADY		1123750455-				290258
1		5062731254-	6790246754-	8469870054	3067078053	291258
2		1850244054-	3951028253-	1891959154	9602697752	292258
3		3548418753-	3041501053-	4673542953	7353376552	293258
4		8871028753	2195008553	9138556353	3474468851	294258
5		1375106254	2052049553-	1390333154	7030249552	295258

28	PER CENT	RADIUS				
COEF		COSINE	SINE	MAX	PSI	
STEADY		9568354253-				300258
1		1052397754	2429815254-	2647931854	2934183353	301258
2		4416248353-	2549734852-	4423602653	9165216352	302258
3		2649746853-	2796960253	3852810053	4448393252	303258
4		1030460053-	5099444352-	1149735253	5158236552	304258
5		6699385753	8234892253-	1061580054	6182592252	305258

36	PER CENT	RADIUS				
COEF		COSINE	SINE	MAX	PSI	
STEADY		7913750053-				310258
1		4361311553	1920378054-	1969279654	2827952353	311258
2		4748748753-	1134492753	4882385553	8328184652	312258
3		1146246953-	5076250753	5204056453	3424144252	313258
4		1310001653-	1985363353-	2378607153	5914550052	314258
5		4644928753	8142469253-	9374175653	5994058252	315258

45	PER CENT	RADIUS				
COEF		COSINE	SINE	MAX	PSI	
STEADY		4686000053-				320258
1		2506776353	2030165754-	2045583654	2770390553	321258
2		7693498353-	1613405253	7860851953	8407806852	322258
3		3450035052	6969001253	6977535753	2905528652	323258
4		3346501053-	1015847353-	3497286853	4922148452	324258
5		1909215553	6677343053-	6944927253	5719130652	325258

		HARMONIC		ANALYSIS		
60	PER CENT	RED BLADE	BEAM	BENDING		
COEF		RADIUS				
STEADY		COSINE	SINE	MAX	PSI	
1		2804243354-	2109247554-	2187513754	2853728053	330258
2		5799063553-	3083569553	1283791954	8305105852	331258
3		1246209354-	6621466853	7055415753	3673326852	332258
4		2436199353-	1244246553	2223498853	3649314852	333258
5		1842769053-	2602332253	5847818053	3071521752	334258
		5236873353-				335258

65	PER CENT	RADIUS				
COEF		COSINE	SINE	MAX	PSI	
STEADY						
1		3368118854-	2191307054-	2240812054	2829850553	340258
2		5053008253	3479790553	1360850654	8259226252	341258
3		1315608254-	7906617253	9349711753	4075265952	342258
4		4990241853-	2469527753	2731191853	2882126052	343258
5		1166551253-	9405052853	1131142854	2475010352	344258
		6284375853-				345258

80	PER CENT	RADIUS				
COEF		COSINE	SINE	MAX	PSI	
STEADY						
1		4140564654-	1062914654-	1063057254	2690614653	350258
2		1741283352-	2783903352	1167224654	8931666752	351258
3		1166892654-	5721958253	7956859453	4467263752	352258
4		5529087353-	1837378253	3400170753	3682265452	353258
5		2860979353-	1943709354	2080246854	2217484952	354258
		7412292353-				355258

92.5	PER CENT	RADIUS				
COEF		COSINE	SINE	MAX	PSI	
STEADY						
1		2187291754-	1267784353-	4040776253	1982852453	360258
2		3836742853-	6856033352-	4329622453	9455562152	361258
3		4274994553-	3245832853	4021948553	4206441752	362258
4		2375003053-	1782567253	3097631153	3621701452	363258
5		2533332353-	9976112353	1050406854	2164858052	364258
		3288257353-				365258

		HARMONIC		ANALYSIS		
WH.	BEAM	BEND	.15R			
COEF		COSINE	SINE	MAX	PSI	
STEADY						
1		1091866755-	5481975354	6884833854	1272275453	750458
2		4165199054-	4029395053-	2280742754	1016609753	751458
3		2094394354-	1097516753-	1552100653	1049997353	752458
4		1097485053-	1425681753	7723758453	2659219151	753458
5		7591039253	4445224353	1447139554	3242220952	754458
		1377175554-				755458

WH.	BEAM	BEND	.25R			
COEF		COSINE	SINE	MAX	PSI	
STEADY						
1		1414666753-	2125548254	2288425254	1117474453	760458
2		8479001753-	4805275052-	3913712653	9352627052	761458
3		3884100853-	3051763853-	4124318653	1040911153	762458
4		2774300253	2000000046-	8323321052	4500000052	763458
5		8323321052-	7320152353	8930337353	2498916052	764458
		5115300053-				765458

		CHORD RED		BENDING BLADE					
PER	CENT	K	O+11201K	D E G	R E E S	30+11201K	60+11201K	90+11201K	
RADIUS									
15		0	8893500055	7276500055	4851000055	5120500055			67158
		1	3234000055	2964500055	4042500055	5929000055			68158
		2	7546000055	6468000055	8624000055	9702000055			69158
28		0	7595950055	6182750055	4592900055	4416250055			77158
		1	3533000055	2738075055	4062950055	5122850055			78158
		2	6536050055	6182750055	7419300055	8302550055			79158
40		0	3546235055	2855410055	2717245055	2072475055			87158
		1	2763300055	1704035055	2579080055	2533025055			88158
		2	2786327555	3108712555	3315960055	3960730055			89158
80		0	2304715055	2163610055	2116575055	1787330055			97158
		1	2304715055	1693260055	2257680055	1975470055			98158
		2	2210645055	2351750055	2398785055	2539840055			99158
WH. CHORD BEND .15R		0	4592280055	6013700055	8091160055	7216440055			737458
		1	9184560055	1049664056	8747200055	7435120055			738458
		2	4810960055	5467000055	3498880055	3280200055			739458
WH. CHORD BEND .28R		0	4607040055	5254905055	6982545055	6190710055			747458
		1	7630410055	8638200055	7342470055	6622620055			748458
		2	4607040055	4694980055	3887190055	2663445055			749458

# HARMONIC ANALYSIS

		15 PER CENT	RED BLADE RADIUS	CHORD	BENDING		
COEF	STEADY		COSINE	SINE	MAX	PSI	
1			6220958355	1840718755-	2868531955	3200817753	100158
2			2200052355	1555960854	3915738254	1170664652	101158
3			3593326054	6737491054-	7635828554	9935752352	102158
4			3593340054	8333333348	8983338353	4499986852	103158
5			8983338353-	4932195754	5110682154	2103740852	104158
			1338849554-				105158

		28 PER CENT	RED BLADE RADIUS	CHORD	BENDING		
COEF	STEADY		COSINE	SINE	MAX	PSI	
1			5557114655	1511205955-	2279754355	3184800453	110158
2			1706908555	6374298353	2087031654	8891842151	111158
3			1987305754	4563450554-	5276958454	1000471653	112158
4			2649756554	1274935053	1472145353	1500038552	113158
5			7360383352	1716109554	2676423754	2802380452	114158
			2053828754-				115158

		60 PER CENT	RED BLADE RADIUS	CHORD	BENDING		
COEF	STEADY		COSINE	SINE	MAX	PSI	
1			2828544755	4236392754-	7132025154	3235589353	120158
2			5737487254	1229781554-	1671585054	1563168953	121158
3			1132181054	1496784054-	1699983354	9943364152	122158
4			8059658353	4320886753	4325145553	2313571452	123158
5			1918916752-	2441578754-	2979504754	4700611352	124158
			1707671554-				125158

		80 PER CENT	RED BLADE RADIUS	CHORD	BENDING		
COEF	STEADY		COSINE	SINE	MAX	PSI	
1			2175368855	1760996054-	2360538954	3117537153	130158
2			1571953354	6788915053-	6967593853	1415018353	131158
3			1567800053	1567808353-	1752879753	9885538352	132158
4			7839416752	4073373353	4073373353	2249995852	133158
5			1166666748	1217884754-	1867067354	4414302152	134158
			1415166854-				135158

# HARMONIC ANALYSIS

WH. CHORD BEND .15R						
COEF		COSINE	SINE	MAX	PSI	
STEADY		6569511755				770458
1		2139710755-	2068606055	2976154055	1359680053	771458
2		2460140854	1578175053-	2465197654	1781647653	772458
3		2915727754-	6742637054	7346061754	3779505852	773458
4		6378066753-	7890898353-	1014623154	5776301052	774458
5		3538256854	5196213754-	6286485354	6085042252	775458

# HARMONIC ANALYSIS

WH. CHORD BEND .28R						
COEF		COSINE	SINE	MAX	PSI	
STEADY		5776796355				780458
1		1629675355-	1483037355	2203461255	1376971853	781458
2		1499680754	9351141753	1767337254	1597264052	782458
3		2279519854-	5518854054	5971093754	3748090052	783458
4		1799530053-	7273130053	7492444753	2597428252	784458
5		4899142354	2832866754-	5659216354	6599238052	785458

			0° (120)°	30° (120)°	60° (120)°	90° (120)°	
R/B TORS	.15R	0	4942240054-	6177800054-	4324460054-	4942240054-	487358
		1	4324460054-	5560020054-	4942240054-	3706680054-	488358
		2	1235560054-	3088900054-	3706680054-	5560020054-	489358
R/B TORS	.50R	0	2206320054-	2054160054-	2054160054-	1902000054-	497358
		1	1369440054-	1521600054-	1597680054-	1141200054-	498358
		2	1179240054-	8368800053-	1711800054-	1407480054-	499358

HARMONIC ANALYSIS

R/B TORS	.15R		COSINE	SINE	MAX	PSI	
COEF			4375941754-				560358
STEADY			5626024353-	1049830454-	1191077454	418132253	561358
1			9266691753-	5350132753	1070025754	7499999352	562358
2			4118530253	1029637253-	4245284553	1153212353	563358
3			1029636753-	1783380253-	2059270953	5999999252	564358
4			1507482053	2019630052	1520950753	1526138451	565358
5							

R/B TORS	.50R		COSINE	SINE	MAX	PSI	
COEF			1581830054-				570358
STEADY			3181826553-	3399785753-	4656453953	2268967453	571358
1			1616698553-	6039660052-	1725829953	1002423453	572358
2			1014399253	6339816751	1016378453	1192078151	573358
3			5389020052-	1647193352-	5635138252	4924904052	574358
4			8757775052-	1862416353-	2058052653	4896306952	575358
5							

		STEADY	STATE	DATA			
				D E G	H E E S		
RED BLADE	PITCH	K	0+1120JK	30+1120JK	60+1120JK	90+1120JK	
		0	1928348052	1724525552	1404233052	1252822052	867558
		1	1206234052	1375115552	1625526052	1899230552	868558
		2	2167111552	2312699052	2347640052	2236993552	869558
RED BLADE	FLAP	0	1010800051-	5320000050	1436400051	2553600051	877558
		1	3192000051	3245200051	3298400051	1489600051	878558
		2	8512000050	4788000050-	1170400051-	1383200051-	879558
VERTICAL	ACCEL	0	9786850050	9786850050	9969550050	9725950050	887558
		1	1048720051	8995150050	9756400050	9817300050	888558
		2	1000000051	9695500050	1060900051	9299650050	889558
FORE- AFT	ACCEL	0	1388100050-	4296500049-	2966000049-	4296500049-	897558
		1	6610000049-	1255900050-	1222850050-	6610000048-	898558
		2	4957500049-	4957500049-	1156750050-	1454200050-	899558
LATERAL	ACCEL	0	4056000049	3380000048-	3380000049-	7098000049-	907558
		1	9464000049-	9464000049	5408000049	3380000048	908558
		2	2366000049-	7436000049-	1081600050-	1014000050	909558

# HARMONIC ANALYSIS

RED BLADE PITCH		COEF	COSINE	SINE	MAX	PSI	
STEADY			1790040052				910558
		1	1811990551	5378876751-	5675881051	2886172153	911558
		2	7279150049	4202750049	8405303949	1500038652	912558
		3	1261733350-	3882583349	1320119550	5429863952	913558
		4	1019108350-	8403166748-	1022566950	4617843252	914558
		5	1717033350-	11831176750	2085212350	2908599552	915558

RED BLADE FLAP		COEF	COSINE	SINE	MAX	PSI	
STEADY			1046266751				920558
		1	1839236251-	1525424751-	2389500051	1403283953	921558
		2	1416666744-	6143020049	6143020049	4500006852	922558
		3	8866671749-	1063998850	1385017050	4326854152	923558
		4	4433365749	1535756749-	4691831249	8522337052	924558
		5	2266964250-	9717535349	2466461450	3135943952	925558

VERTICAL ACCEL		COEF	COSINE	SINE	MAX	PSI	
STEADY			9827450050				930558
		1	5224318348	4481185048-	6882915248	3193785053	931558
		2	2436012849-	2637065048	2450244849	8691080652	932558
		3	1014900048-	6089888348-	6173877448	8684614252	933558
		4	8627408348-	3516073349	3620371949	2594658352	934558
		5	2686630048-	8617833346-	2688011848	3636744752	935558

# HARMONIC ANALYSIS

FORE- AFT ACCEL		COEF	COSINE	SINE	MAX	PSI	
STEADY			1870916749-				940558
		1	1416877549-	8311218548	1642651949	1496046753	941558
		2	3222373049-	4531839249	5560688449	6270740752	942558
		3	3855828348	3855845048-	5452976548	1049999653	943558
		4	9639581748-	1860438249	2095339049	2934756552	944558
		5	2050433348	8862055048-	9096169348	5660548452	945558

LATERAL ACCEL		COEF	COSINE	SINE	MAX	PSI	
STEADY			9576666748-				950558
		1	4224993348-	1546683346-	4225667248	1810233153	951558
		2	7802165349	7317919548-	7836408749	1773208653	952558
		3	1689991748	2816678348-	3284775348	1003211853	953558
		4	3098361348-	4927395849-	4937127449	6660049452	954558
		5	4225016548-	1051186748-	4353821148	3879431052	955558



		STEADY	STATE	DATA			
				D E G	K E E S		
LIFT LINK	LOAD	K	0+(120)K	30+(120)K	60+(120)K	90+(120)K	
		0	5355031554	4986696054	5071696554	5156697054	1037658
		1	5978368554	4873362054	5355031554	4873362054	1038658
		2	5156697054	5326698054	6063369054	5156697054	1039658
RT. CYCLIC	LOAD	0	1040000053	2496000053	2496000053	2080000052	1047658
		1	3120000052	4160000052	6240000052	1664000053	1048658
		2	2080000053		2080000052	2080000052	1049658
LT. CYCLIC	LOAD	0	1128000052	9024000052	9024000052	4512000052	1057658
		1	4512000052	2256000052	1128000052	1128000053	1058658
		2	9024000052	4512000052	7896000052	9024000052	1059658
COLLECTIVE	LOAD	0	1190400053	7936000052	5952000052	7936000052	1067658
		1	9920000052	1388800053	1190400053	3968000052	1068658
		2	2976000052	1190400053	9920000052	1190400053	1069658
STABILIZER	BAR	0	1137400051	3102000051	3722400051	2791800051	1077658
		1	1189100051	1189100051	3463900051	5273400051	1078658
		2	5997200051	4963200051	3308800051	1240800051	1079658
HARMONIC ANALYSIS							
LIFT LINK	LOAD	COEF	COSINE	SINE	MAX	PSI	
		STEADY	5279475754				1080658
		1	5725423352	6103711752	8815907452	3104995753	1081658
		2	1605572253	2462711553	3282221753	1203569053	1082658
		3	5500000047	6333333347	8388153047	1634275452	1083658
		4	1888951752	2371966553	2379476153	2136169352	1084658
5	5725326752	1796261752	6000493552	3948374252	1085658		
RT. CYCLIC	LOAD	COEF	COSINE	SINE	MAX	PSI	
		STEADY	8926666752				1090658
		1	2027332052	1663667852	2622568552	3937296452	1091658
		2	3033334552	1245921953	1282315353	3815845452	1092658
		3	1733333351	1386666552	1397457852	3237500752	1093658
		4	4246666552	2251665552	4806680152	5196335452	1094658
5	2260029251	7630020051	7957696751	1470011852	1095658		
LT. CYCLIC	LOAD	COEF	COSINE	SINE	MAX	PSI	
		STEADY	1598000052				1100658
		1	9332514351	1240438152	1552303152	1269562153	1101658
		2	4981998052	3093442752	5064272552	7408143252	1102658
		3	5640004751	1503999252	1806272152	2314797652	1103658
		4	3289999252	2698447752	6580000152	7499999852	1104658
5	3692513351	2635617051	4536643151	7103646051	1105658		
HARMONIC ANALYSIS							
COLLECTIVE	LOAD	COEF	COSINE	SINE	MAX	PSI	
		STEADY	9176000052				1110658
		1	5343665051	2642159051	5961187851	2630995552	1111658
		2	1405331652	3579572052	3845555052	1457174353	1112658
		3	4959987551	1653334352	1726131252	3556640052	1113658
		4	1736000752	4295480051	1788354052	8652553752	1114658
5	3836516750	5948819551	5961177951	5326199852	1115658		
HARMONIC ANALYSIS							
STABILIZER	BAR	COEF	COSINE	SINE	MAX	PSI	
		STEADY	1124475051				1120658
		1	2403448351	4046877351	4706780251	5929383952	1121658
		2	4308318249	1492440049	4559493749	8044673052	1122658
		3	1034005250	1120163250	1524444950	4423654252	1123658
		4	1866666744	5969760049	5969760049	2249995552	1124658
5	6022833347	5736079249	5736395449	5412031652	1125658		

			STEADY	STATE	DATA			
					D E G	R E E S		
R F	PYLON	K		0+11201K	30+11201K	60+11201K	90+11201K	
		0	3687500049	7080000049	9735000049	9145000049	447358	
		1	5752500049	1475000049	4130000049	7375000049	448358	
		2	1032500050	9440000049	6195000049	1770000049	449358	
R A	PYLON	0	1110000050	1380000050	1320000050	9900000049	457358	
		1	7800000049	6300000049	1110000050	1410000050	458358	
		2	1380000050	1020000050	7500000049	6000000049	459358	
L F	PYLON	0	6000000048-	4200000049-	5400000049-	2400000049-	467358	
		1	9000000048	3600000049	1350000049-	4950000049-	468358	
		2	5700000049-	2400000049-	1200000049	3900000049	469358	
L A	PYLON	0	1128500050	4880000049	1525000049	3050000048-	477358	
		1	5642500049	8845000049	1052250050	4270000049	478358	
		2	3050000048-	1525000049-	5185000049	8387500049	479358	

# HARMONIC ANALYSIS

R F			PYLON					
COEF		COSINE	SINE	MAX	PSI			
STEADY		6342500049						520358
1		8604215047-	2473612848-	2618985648	2508202853			521358
2		2986874849-	2788962849	4086530949	6848125152			522358
3		4916568347-	4916601747-	6953101247	7500006752			523358
4		2581259048	4470862248	5162509848	1499998752			524358
5		8603990047-	5069553347	9986441647	2989860152			525358

R A			PYLON					
COEF		COSINE	SINE	MAX	PSI			
STEADY		1040000050						530358
1		1616030848-	9330001747-	1866023848	2099995953			531358
2		1749995248	3940416049	3944300149	4372854052			532358
3		1500010748	5000078347	1581151448	6145032051			533358
4		1750011848	5629173748	5894924848	1818261152			534358
5		1160491747	6698483346-	1339939547	6600119852			535358

L F			PYLON					
COEF		COSINE	SINE	MAX	PSI			
STEADY		1450000049-						540358
1		3265549548	3749981747	3287010548	6550844851			541358
2		1087499149	4308476749-	4443605049	1420830453			542358
3		2499975047	7500013347	7905698947	2385508552			543358
4		2375004248-	4979648848-	5517021648	6112539052			544358
5		2344468347	3749988347	4422549547	1159732952			545358

L A			PYLON					
COEF		COSINE	SINE	MAX	PSI			
STEADY		4867291749						550358
1		2634702048	6224644548	6759279148	6705854552			551358
2		5134165249	2553331749-	5734034849	1667789253			552358
3		1016668348-	2541611747-	1047956248	6467864552			553358
4		1270835748	2201151848	2541671248	1500000052			554358
5		2194471748	3788078347-	2226928448	7004123252			555358

				D E G	R E E S		
				0+11201K	30+11201K	60+11201K	90+11201K
RED	PITCH LINK	0	2228000053-	1949500053-	8355000052-	4177500052-	507358
		1	2785000052	5570000052-	1392500053-	1114000053	508358
		2	2228000053	2785000052	1671000053-	2506500053-	509358
WHITE	PITCH LINK	0	2916000052-	1166400053	8748000052	2916000052-	517358
		1	1166400053-	2187000053-	1749600053-	2624400053-	518358
		2	1603800053-	1458000053-	1166400053-	1458000052-	519358

# HARMONIC ANALYSIS

RED			PITCH LINK					
COEF		COSINE	SINE	MAX	PSI			
STEADY		6382291752-						580358
1		1280564453-	3696670052-	1332853753	1961021153			581358
2		9051247852-	7235643552	1158790853	7068043552			582358
3		6962500352	6962516751-	6997226352	1180964653			583358
4		3017083552-	8039603351-	3122362152	4873021752			584358
5		1665644752	4808286751-	1733657552	6877959052			585358

WHITE			PITCH LINK					
COEF		COSINE	SINE	MAX	PSI			
STEADY		8869500052-						590358
1		1291326853	6979549352	1467878153	2839097552			591358
2		1093498052-	3577550352	3740936252	5349803252			592358
3		1701001552-	9719987851	1959129352	5008505952			593358
4		6075014551-	1052222152-	1215001852	5999999252			594358
5		3922269352-	175503851-	3926195952	3651254052			595358

IBM TAB NO. 8  
24 POINT ANALYSES OF TYPE I  
STEADY STATE FLIGHT CONDITION NO. 29  
LEVEL FLIGHT, TRUE AIRSPEED 89 KNOTS

COEF	COSINE	SINE	MAX	PHI
10290000	8487129654-			
10290001	4258808854-	5071090854-	6622191054	3100242553
10290002	1157384354-	4315855653-	1235234654	1002251853
10290003	3039401853	4242241853	5218675953	1812662452
10290004	4161266853-	1825161353	1650319053	3749998452
10290005	2131054854	1069687854	2384453054	5330872051
10290006	5268767653-	2490681453	5827813153	2578311752
10290007	9105812552-	4267807953-	4363867853	3885084952
10290008	4789895852	1659710052-	5069130152	4261175352
10290009	6008564252	1176762553	1121286653	6094565151
10290010	1016318353	6655447552-	1231677153	1222996052
10290011	4558775051	3017805052-	3052644852	2532649152

COEF	COSINE	SINE	MAX	PHI
20290000	1523143853-			
20290001	1491488354	2323691254-	2761173354	3026948553
20290002	3017078753-	1657049253	3442176153	7561170052
20290003	3941773053	5804239453	7016179153	1860626852
20290004	1258795353-	6124419952-	1399875353	5148608252
20290005	1060197754	5809407953	1208929654	5744148951
20290006	1527522353	4243143352-	1587360253	5741263552
20290007	8350649252-	3244791751	8356950952	2539646052
20290008	4384569252	8574161751-	3630197152	3713548152
20290009	3013571752	3164105052	4369935852	5155598451
20290010	2166148152	4020385051	2203141752	1051449051
20290011	4375013352	2045822252-	4829713252	3044895552

COEF	COSINE	SINE	MAX	PHI
30290000	1887062553-			
30290001	1240266954	2222321854-	2544990454	2991656853
30290002	4448875653-	1859982353	4822035753	7865560752
30290003	5372276453	6269504053	8256193553	1646901752
30290004	5986308352-	2522081352-	6495904952	5071152552
30290005	7676058353	3563181053	8462750453	4980092651
30290006	2879889353	9707519252-	3049098853	5689534852
30290007	1633073351-	1246746353	1249060753	1335764452
30290008	4853724251-	3644780452-	3675172452	3280136252
30290009	6392925051	1376495152-	1519893052	3277151752
30290010	4695914552-	1785954051	5024066652	1591771552
30290011	5775030852	1034777552-	5867008452	3180175252

COEF	COSINE	SINE	MAX	PHI
40290000	5600133353-			
40290001	1397353054	2574587254-	2929350654	2984908353
40290002	7571177753-	1210072153	7667268553	8545972152
40290003	6365944653	7827443753	8630521853	1415705052
40290004	1696687452-	8228400052	8401506752	2541276052
40290005	1798762853	7497120852	1748747253	4522084951
40290006	3562997953	1527002953	3876427753	5613356052
40290007	3072352852	5037884252	5400816052	8374725351
40290008	1696666052-	1175515552	2064100852	1816053752
40290009	1072343453-	2127172352-	1023236453	2124663052
40290010	1656221352-	6224296752	6419913952	1049028452
40290011	4872700050	2215206652	2215742452	8067261051

COEF	COSINE	SINE	MAX	PHI
50290000	3015087554-			
50290001	1267957854	2568110354-	2864071854	2962770253
50290002	9291568353-	1278838753	9379161453	8608169052
50290003	3523346253	4476857353	5657067453	1726567852
50290004	1228610253	7811711752-	1455422953	8188777652
50290005	7809118553-	3513432053-	8563091553	4084473052
50290006	9331465051	4043593352-	4149868652	4716579252
50290007	1010584753	7350869252	1244853653	5147383551
50290008	5132165052-	6734754252	8466153352	1591387252
50290009	3967225051-	5619801752-	5633787452	2955133152
50290010	1329893352-	2835115052-	3131532152	2448697152
50290011	4067123352-	1170151452	4232108952	1490445152

COEF	COSINE	SINE	MAX	PHI
60290000	3593281354-			
60290001	1140019754	2535318654-	2779835554	2942113353
60290002	9597994253-	2119212153	9829168553	8377450952
60290003	2382853253	4480078853	5074356653	2066416452
60290004	8459690052	1916122353-	2094561653	734537352
60290005	111005854-	5018683853-	1218106854	4086413052
60290006	2635531853-	5531318352	2692952553	2802451652
60290007	7089572152	4245963352	8263790752	4416786151
60290008	1626843352-	1070775253	1083063153	1232987152
60290009	2201547552	6608480852-	6465545952	3204721952
60290010	7152628352	9804075852-	1213589753	3061128752
60290011	4885002552-	3764732752	6167370752	1294359952

COEF	COSINE	SINE	MAX	PHI
70290000	4123497554-			
70290001	2304525254	1296211054-	1316539654	2800812353
70290002	8396058354-	1452742754	8520813153	8504175152
70290003	5716270052	3277028852	3326510953	-2670179052
70290004	8103700051-	2049110853-	7050712654	6693382452
70290005	1277980954-	6377067553-	1423780354	4132176752
70290006	5471705153-	3921908153	6736959052	2406637252
70290007	1177606653-	9356250852-	1504045153	3120966452
70290008	1183059753	1263154853-	1730661853	3914058352
70290009	9841797552	6192023352	1162764553	3574142951
70290010	3118233351-	3299129252	3314031852	9539905551
70290011	5178054252	4470295852-	6840744852	2901776752

COEF	COSINE	SINE	MAX	PHI
80290000	1902858554-			
80290001	3487744053-	9885802552-	3625141253	1958250753
80290002	3567481353-	6279019252	3622317553	8500889552
80290003	9319016751-	1262253853	1265719153	3140743252
80290004	5124723352-	9559031752-	1084610053	6045091552
80290005	5658875853-	3045681753-	6126433853	4165794552
80290006	1182620853-	2483510653	2750712153	1924383152
80290007	2583947552-	9492055852-	9433998152	3641761852
80290008	1971055052	1229021753-	1244726853	3488891052
80290009	4085585852	3145492552-	5156178452	3582303052
80290010	2561368352	8166675051	2688410952	1768437951
80290011	5747448352	5516389552	7966619452	3984217851

COEF	COSINE	SINE	MAX	PHI
90290000	4334678354-			
90290001	1689768353-	9221469253-	9375009953	2596161653
90290002	4812173453-	5947099353	7650163653	6448925952
90290003	1556248153-	5747357553-	5954328353	8494966352
90290004	1271166953-	8806924252	1546442553	3632123352
90290005	2426782751	1582158353-	2896981053	6537947552
90290006	6215571747	8898160853	8898160853	1499999352
90290007	2054561453-	1409402453-	2491513153	3063566052
90290008	2542390052	8806863352	9166492752	9237185051
90290009	4776165052-	3542383352	5946446952	1593738252
90290010	1289414453-	6629538352	1449861153	1527899952
90290011	3096040052	2418014252-	3857858152	2919884752

COEF	COSINE	SINE	MAX	PHI
100290000	1577075054-			
100290001	3246081053-	4547897053-	5537523853	2344824853
100290002	1115415453	3367934252-	1165152953	1715993053
100290003	4985735052	2448979853-	2499215453	9383575152
100290004	1585021751-	5765135052	5767313552	2289371452
100290005	1487613253	6451962552	1621502853	4689395051
100290006	1585011352	1901980052	2475841052	8365655451
100290007	8423972552-	2751228352	8861860452	2313046152
100290008	4596518852	4117958352-	6171350452	3976790952
100290009	3083740052-	4201818352-	5211979452	2596942652
100290010	3761191751-	4318892252	4335238952	9497716351
100290011	6193575051-	1333836052	1470619752	1044613552

COEF	COSINE	SINE	MAX	PHI
110290000	1587845352			
110290001	1394344551	5162733651-	5345112551	2850103053
110290002	5906958349-	3178369249-	6707770649	1041417353
110290003	9789608349	3689340850	3817014550	2504637352
110290004	1997175049	4324108349-	4763047449	7369770052
110290005	1194924850	2518666748-	1195190250	7175850152
110290006	2995946249-	3495175049	4603470649	2176701252
110290007	4473858348	1268258349	1344654349	1008134252
110290008	2496268349	1729741749	3036998849	4339911151
110290009	8023081348-	1943075049	2102198749	1249289452
110290010	1582866749-	2313357549-	2803050149	2356189352
110290011	1952500049	4522515849-	4925992849	2666829552

COEF	COSINE	SINE	MAX	PHI
120290000	1854166750-			
120290001	1001955151-	1076661651	1470752951	1329416653
120290002	3415054249-	7856831349	8566936049	5674634252
120290003	3510619150-	1398182450-	3778804050	6723867852
120290004	2916651149	4330125849	5220608749	3099077652
120290005	1650046450-	1423821850-	2179431550	4415817052
120290006	6249986149-	1666674249	6468394649	2751141552
120290007	8583602548	1116445049-	1408272649	4393632852
120290008	4166702548	4330109249	4350110349	1056294652
120290009	2606166749	1018162549	2797999449	2371077251
120290010	9150725048	3690195849-	3801960449	2839269452
120290011	8375900048	4555879248-	9534764648	3013245752

COEF	COSINE	SINE	MAX	PHI
130290000	9371741751			
130290001	2899772751-	4848282251-	5649297951	1208817853
130290002	1828184051	2171846950-	1841039451	1766125653
130290003	1193000750	5886184249	1310109150	8754806351
130290004	6013646050	4179283550-	7323274550	8130050052
130290005	4988644350-	1014870650-	5090828451	3829982452
130290006	6675417649-	7011450849-	7580996049	173440352
130290007	1213422450-	9240311749	1525197550	2038720452
130290008	2606558650	2014121350-	3294060150	407882852
130290009	1727559249	1691747350	1700545150	7352149551
130290010	9957292449-	2705112850-	2882553050	2497917652
130290011	1266107550	2198697549	1285060250	8956821850

COEF	COSINE	SINE	MAX	PHI
140290000	2128302752			
140290001	6117535050	5839224250	8453379450	4369000052
140290002	3177810751	4381708349	1178112651	3949399050
140290003	1496380551	1334242351	2004633451	1390722652
140290004	6398932550	1123119250	6496748050	2488741351
140290005	6481749250-	1624830050-	1426470650	4184410252
140290006	1271757650	6144981750-	6275608250	4695177952
140290007	2112456750	1225247550	2976548950	3472747951
140290008	7758258349	2350410050	2475143050	8966614851
140290009	2431180050	2452481750-	3453301250	347223252
140290010	2877813350	1489280050-	3236782050	1326057152
140290011	3412311750	8930787549	1670991950	2917028651

COEF	COSINE	SINE	MAX	PHI
150290000	2438525652			
150290001	3602329251	1831793951-	5259227451	3132320553
150290002	2978139851	1043090050	2993646751	2917142751
150290003	1181769351	7621004250	1406191951	1093906652
150290004	1410872051	2783998150-	1438077351	8720938552
150290005	3954895050-	1351330050-	4180035450	3977809952
150290006	6072259150-	5655997250-	8298352750	1716121952
150290007	1448397350-	3483845850-	4712934850	3534643952
150290008	1151435850	1129377550	1758706650	6137829951
150290009	1448030850	2365978350	2555755650	6165369151
150290010	1395446750	1614071750-	2133658650	1088450852
150290011	1188649250-	4287148349-	1264606150	1816671952

COEF	COSINE	SINE	MAX	PHI
160290000	2333448052			
160290001	1890939151	6522554851-	7594940951	3008176053
160290002	1047848751	1396327550	3051045651	1311544351
160290003	1038229751	1279451051	164700251	1698062452
160290004	1111167751	2416227550-	2143959251	8666905752
160290005	5634655050-	4769946750-	7369622250	4402639952
160290006	6737222650-	7155413250-	1174955651	1894343752
160290007	2019453350-	4506405050-	4948205950	3512306352
160290008	1349643350	1046746750	1701479550	4692679751
160290009	2907085050	2052666750	3546733550	3913752651
160290010	1361037550-	8854133349-	1623893550	2110457352
160290011	1612176750-	3202937850-	3585794450	2211653852

COEF	COSINE	SINE	MAX	PHI
170290000	2040115552			
170290001	1987613651	5169423251-	6688181251	3065995153
170290002	2288687151	1090317550-	2271305751	1786242453
170290003	7500620050	1050450551	1290751451	1815723552
170290004	4491404250	5003105050-	6723375050	7797876652
170290005	4238266750-	8417632550-	7424406750	4865496252
170290006	3759441550-	8590407550-	7376978650	4106069052
170290007	1127176650-	3750386750-	3916111350	3618189752
170290008	1255775850	1643165850	2068082950	6576429151
170290009	1123729250	2725385050	2947963850	7510298851
170290010	5771925049-	1402124250-	1516279550	2476252052
170290011	2031375049-	4134495950-	3141071450	2420836552

COEF	COSINE	SINE	MAX	PHI
180290000	3277380654			
180290001	2496513352-	2019417353	2034790453	9704746052
180290002	4764557553	8653541751-	4765343253	1794797553
180290003	1499258853	1337003353	2008819253	1390860752
180290004	1374480353	4269982552-	1439278853	8568549552
180290005	1020494753-	5088139252-	1140307453	4130012752
180290006	2323040852-	7857775552-	8189177852	4725341952
180290007	2664583344	2472100051-	2472243651	3865965052
180290008	1186590052	4211116751	3215754552	9652981650
180290009	2473361752	8946786751	2640202352	2709591451
180290010	9997958351	3762149252-	3892779952	2848822652
180290011	1446344252	1780755851-	1457265152	3208918952

IBM TAB NO. 9  
TYPE II STEADY STATE CONDITION NO. 65  
LEVEL FLIGHT, TRUE AIRSPEED 33 KNOTS

COEF	COSINE	SINE	MAX	PHI
10650000	1014918755-			
10650001	2904949154-	1804593654-	3419837354	3281508953
10650002	8464860853	4286749453-	9488418653	1665707953
10650003	1033949154-	4786128753-	1139351154	5172022952
10650004	6753595053	6553958353-	9410919953	7896487252
10650005	1438343353-	9778159253-	9883381453	522638952
10650006	7184678353-	4119210353	8281756853	2502882552
10650007	1302400554-	9194475053	1594249354	2068275752
10650008	1293255353	1078496653	1683943153	4978257651
10650009	1717879253	4019755353	4371446253	7428901551
10650010	9927620052-	3590953352	1055711153	1601142752
10650011	1367334853-	2723618253-	3047572953	2212200352

COEF	COSINE	SINE	MAX	PHI
20650000	4106312553-			
20650001	3751510553	9262979253-	9993828853	2920479853
20650002	2118836352-	3361322052-	3973405752	1188872053
20650003	8091014053-	5907680853	1001824354	4795494252
20650004	1046637453-	5879456352	1200470753	376875752
20650005	2456602352	4349798353-	4356729753	5464648452
20650006	1216363153	1159786853	1680667953	7272673751
20650007	1561898853-	1248701053	1999695553	2019407152
20650008	2262993452	3429669252-	4108986552	3792724652
20650009	3099674252	5330547452	7377087052	5140892551
20650010	5230489852	9867419252	1116798953	6207247651
20650011	2237524352	3882381751-	2270956652	3183240752

COEF	COSINE	SINE	MAX	PHI
30650000	1401687553-			
30650001	1355279353-	9142265853-	9242175453	2615677053
30650002	2416107753-	3891501152	2447246253	8542512652
30650003	7999241853-	7207895453	1076762054	4599295652
30650004	2782813853-	2634175153	3831831353	3414294252
30650005	6898917552	2566127953-	2657247353	5700958152
30650006	4109508853	6471583351	4110018453	1503682550
30650007	2300847353	1540241353-	2768797953	4660010252
30650008	4853764252-	3362766052-	5904843952	2683935052
30650009	2197742552-	1075839553-	1098058053	2871715452
30650010	4422519252	2273614652-	4972725552	3327523352
30650011	7590563352	9631201752	1226281853	4705233651

COEF	COSINE	SINE	MAX	PHI
40650000	3072100053-			
40650001	4129549653-	1048894054-	1127257954	2485101953
40650002	5140157053-	9676650852	5230448453	8466925752
40650003	8458165853-	9168359253	1247394854	4423091452
40650004	3902330253-	2821164153	4815303553	3603380052
40650005	8268820052	5566904252-	9968142452	6520998952
40650006	3596933853	1119800853-	3767212153	5711792452
40650007	3441234053	3130400853-	4652042653	4538686152
40650008	5090013352-	8228377552-	9675455152	2978242252
40650009	6359670852-	1826043053-	1933620253	2786644452
40650010	8557308351-	5604687552-	5669638252	7613190552
40650011	4043656752	1043178553	1118808753	6255659351

COEF	COSINE	SINE	MAX	PHI
50650000	2630951054-			
50650001	4223600053-	9881779253-	1074655154	2468575253
50650002	8477055053-	1387702553	8589888253	8535154752
50650003	8340826753-	9505859253	1264637354	4375501152
50650004	3888020153-	2370457153	4553654253	3715751952
50650005	1576094252-	2161902053	2167639553	1883393452
50650006	3110389852-	8398149252-	8955637152	4161284752
50650007	1973672853	1030935253-	2226722053	4748860252
50650008	6220608351-	2693700052	2764593952	1287543352
50650009	5549623352-	1364369252-	5714877352	2153468752
50650010	4498321752-	1746505052-	4825471852	2012190652
50650011	6406992552-	4680881752-	7934746852	1965013552

COEF	COSINE	SINE	MAX	PHI
60650000	3217473154-			
60650001	4363348453-	1002566354-	1093401754	2464804653
60650002	1004542454-	1922275053	1022769254	8458347452
60650003	9014753353-	1064760754	1395124854	4341759652
60650004	3741812853-	2536049053	4520255353	3646804452
60650005	4135018352-	3672720053	3695924253	1928474752
60650006	2602996853-	1138815053-	2841213153	3393824352
60650007	5005182552	7386490052-	8922560652	4344601352
60650008	3253784252	5635651752	6507509752	7699962651
60650009	2258921752-	6260515052	6655582252	1220449852
60650010	1310153253-	6249966751	1311643153	1772688352
60650011	7344513352-	7987215852-	1085069153	2067276552



COEF	COSINE	SINE	MAX	PHI
70650000	3966296954-			
70650001	1134662653-	5924258853-	6031940153	2591575553
70650002	1126851154-	2027461553	1144945554	8490011352
70650003	8206153153-	1041846054	1326217454	4274197452
70650004	2025782853-	9824543352	2251446853	3853194252
70650005	4219857552	2378929053	2416066153	1598824652
70650006	5023933553-	5834222552	5057696153	2889600052
70650007	5213134253-	5007921753	7228834553	1945002952
70650008	4861308351-	1319290253	1320185553	1151378552
70650009	6864605852	1407779853	1566228653	7111694351
70650010	1026172153	7923905052	1296499853	3767463851
70650011	6101528352	5222740652	8031542152	3687510951

COEF	COSINE	SINE	MAX	PHI
80650000	1601289254-			
80650001	4559598352-	2061382552-	5003922052	2043276153
80650002	4037700753-	6067760852	4083038653	8572684052
80650003	4818225853-	5273785453	7143396453	4413846552
80650004	7095754252-	1229021653	1419151653	2999999652
80650005	9897270052	1189275852	9968466852	1370384851
80650006	3863240753-	3153672552-	3876091653	3077781252
80650007	4134143953-	4094016153	5818257053	1932563252
80650008	7884416751	8193455052	8231302852	1056293252
80650009	8772916751	8586499252	8631199852	9351808051
80650010	3321482552	2125744252-	3943479952	3273808252
80650011	9985992552	6281257052	1179721353	2924561151

COEF	COSINE	SINE	MAX	PHI
90650000	3101646754-			
90650001	1620251853-	4506289753-	4790604653	2502318853
90650002	4201527253-	3813476752	4218798153	8740691352
90650003	6361122553	2932722853-	7004622953	1117494953
90650004	3177918853-	6605700052	3245836653	4206461052
90650005	9146881752	6078322552-	1098232453	6527900252
90650006	3305027853-	6864296353	7618515153	1928498952
90650007	2812312953-	3093674252	2829277653	2481749252
90650008	1398279253-	1100864453-	1779631453	2727667052
90650009	2489474252	1135008253	1161989053	8625434551
90650010	6422690052	3813430052	7469484352	3069944451
90650011	1484005053	1693054853	2251378653	4433147451

COEF	COSINE	SINE	MAX	PHI
100650000	1348835054-			
100650001	1441210753-	2603493053-	2975779653	2410324953
100650002	4902140452	5490703351-	4932794552	1768045853
100650003	2290477053	2626316751-	2290627653	1197810253
100650004	1141200353-	6039666752	1291167653	3802762652
100650005	9412087551	7880847552-	7936852752	5536211552
100650006	2853013852	3803980052	4754992352	8854970051
100650007	1156670852-	4760325051-	1250751252	2891009852
100650008	1014398853-	1647182552-	1027685353	2365290152
100650009	5786768352-	1530644252-	5985779752	2164620852
100650010	2705891752	5490309251	2761029752	1146972251
100650011	3215492552	3332308352	4630731252	4183825351

COEF	COSINE	SINE	MAX	PHI
110650000	1497473352			
110650001	1493041051	1733943551-	2288172151	3107306553
110650002	8568225049-	1843301450-	2032708850	1225347853
110650003	2780965050-	1525680050	3171981450	5041671952
110650004	8737638349	9040475049-	1260164150	7847443252
110650005	1803890849-	3078333349	3567934749	2407402652
110650006	9486711749-	5987250048	9539137949	2899837752
110650007	2266508349-	3243283349	3956759749	1784958052
110650008	2246984249-	4325043348	2288231149	2113809352
110650009	1846483349	2781416748	1867314549	9518048350
110650010	7985000047	1457548349	1459733949	8686425351
110650011	5597666748	3189157549	3237910649	7276795551

COEF	COSINE	SINE	MAX	PHI
120650000	1645833350			
120650001	2071349351-	3341731350-	2098132451	1891646353
120650002	8344276749-	1097504249	8416143449	8625351452
120650003	2617492350	2509749850-	3626308050	1054012853
120650004	2063327849-	7217051748-	2204794549	4977679552
120650005	1645893749	1270081350	1280701450	1652324252
120650006	2499998849-	2083312549-	3254269249	3663426352
120650007	8038671748	5445025849-	5504044749	3977115852
120650008	3333325849-	1443370049	3632406649	1957335252
120650009	3416166748-	2597507549-	2619875449	2916751552
120650010	4057300048-	1819153349	1863849649	1045730452
120650011	1148201749-	4728541949	4865950749	9422601051

COEF	COSINE	SINE	MAX	PHI
130650000	8822985451			
130650001	1290727851	1914666251	2309096151	5601503652
130650002	7909034150	3775208650-	8763847350	1672417653
130650003	3543293349	6876360849-	7735584349	9908714452
130650004	1087852350-	2771075750-	2976958750	6214158252
130650005	1625955950-	2145290850-	2691840550	4656816752
130650006	1764971550-	6206733349	1870924950	2677086252
130650007	1520678650-	6346691749-	1647807150	2895052552
130650008	1933437549	9911208349	1009803150	9870200851
130650009	9040681749-	5504768349	1058472550	1651813852
130650010	2722158348	2383545849-	2399039849	2765153152
130650011	4850433349	1213286850	1306649150	6200876551

COEF	COSINE	SINE	MAX	PHI
140650000	2305776452			
140650001	1421720050-	4281755850	4511620750	1083683053
140650002	2530601051	8471091749-	2532018451	1790413853
140650003	2254766750	6671250850-	7041985550	9622479052
140650004	4767435050	2322225049	4773087450	6971705850
140650005	5541597550-	1899251750	5858025350	3221641252
140650006	1106377550-	2389546750-	2633249850	4045925452
140650007	5773988250	1028595050	5864891250	1442982251
140650008	3206789250-	1871000050	3712699650	1871732552
140650009	9830900049-	1234820850-	1578368950	2571947952
140650010	4140605050-	4265491749-	4162517750	3541183652
140650011	2783350049	1836578550	1857549750	7398395551

COEF	COSINE	SINE	MAX	PHI
150650000	2436800552			
150650001	7944432550-	1766861351-	1937250451	2457896453
150650002	1591812451	8745506349-	1594213051	1784276553
150650003	2261979051	1826279551-	2907205851	1070277553
150650004	4219261750	6306680550-	7589573250	7594367752
150650005	9505750450-	120332351	1538198951	2563374652
150650006	2775912150-	2653591750-	3840213150	3728490352
150650007	1100190750	5212003350-	5326856350	4027421052
150650008	5757891750	2173050050	6154304450	2584587051
150650009	3012717550	3418626750	4556695750	5401265651
150650010	5442504250-	1146474250-	5561951950	1918955552
150650011	7270108349-	1922071250-	2054970250	2266192852

COEF	COSINE	SINE	MAX	PHI
160650000	2354366052			
160650001	4258288350-	2616684251-	2651106651	2607569453
160650002	5896925049	4218830050	4259843250	4102148152
160650003	2556530551	2413064451-	3515498451	1055512053
160650004	1488006751	1665868351-	2733669951	7794306552
160650005	1308422351-	1537718451	2019370151	2608095852
160650006	6628179350-	8917196750	1111076851	2110392452
160650007	1486034850	4795151750-	5020137350	4103120052
160650008	5871666747	8185330850-	8185332950	3375513852
160650009	3713983350	4155250048	3714215850	7122282649
160650010	5535156750	4953817550	7428207650	4182769451
160650011	1396740050-	2983412550	3294181750	1046250252

COEF	COSINE	SINE	MAX	PHI
170650000	2011898352			
170650001	1389107550-	2493588551-	2497454751	2668115253
170650002	1133869751-	3665320850	1191639751	8104308752
170650003	2248282351	2177254851-	3129730551	1053065053
170650004	2785085551	2205503051-	3552596951	8040609652
170650005	1161777551-	1253789151	1704307251	2656372052
170650006	1799784851-	1571156051	2389091151	2314667752
170650007	1559326850-	1653043350-	2272447850	3238155552
170650008	8428880050	1377773751-	1615153451	3768215952
170650009	5791958350	5488116750-	7979110650	3517143952
170650010	1463383349	6810504750	6813578750	8836557451
170650011	2076578350-	8762463350	9005161950	9393847751

COEF	COSINE	SINE	MAX	PHI
180650000	3214483554			
180650001	7374183352	8166675052	1100332553	4791921752
180650002	2399953053	2757251752-	2415739853	1767230853
180650003	1245275653	1434475753-	1899587353	1036538153
180650004	8522705852	8443767552-	1199723853	7881664252
180650005	9903474252-	5471771752	1131455253	3021578052
180650006	5912690252-	1724771752	6159118652	2728961352
180650007	2567670852	1748824252-	3106657352	4653449652
180650008	3953775051	4739883351-	6172425151	3872914852
180650009	4859441751	1622675051-	6061183751	3592175252
180650010	2288593352	8563008351	2443544652	2051385651
180650011	2784333350-	1302813352	3302930752	8225728251

IBM TAB NO. 10  
TYPE II STEADY STATE CONDITION NO. 66  
LEVEL FLIGHT, TRUE AIRSPEED 92 KNOTS

COEF	COSINE	SINE	MAX	PHI
10660000	8487129654-			
10660001	4258808854-	5071090854-	6622191054	3100242553
10660002	1157384354-	4315855853-	1235234654	1002251853
10660003	3037401953	5642241853-	2218675753	1812662452
10660004	3161266853-	1825163353	3650319053	374998452
10660005	2131054854	1069682854	2384453054	5330872051
10660006	5268767853-	2490681453	5827813153	2578311752
10660007	9105812552-	4687807953-	4363867853	5685084952
10660008	4787895852	1859210052-	5069138152	4261175352
10660009	6008564252	1176762553	121286653	6994565151
10660010	1036318353	665447552-	1231827153	3272906052
10660011	4558775051	3017805052-	3052043852	2532639152

COEF	COSINE	SINE	MAX	PHI
20660000	1523143853-			
20660001	1491488354	2323691254-	2781173354	3026948553
20660002	3017078753-	1657049253	3442178153	7581170052
20660003	3941773053	5004239453	7016179153	1860628852
20660004	1258755353-	6124419952-	1399675353	5148608252
20660005	1060197754-	5807802253-	1208228854	5764148951
20660006	1577522553	4243143352-	1585360253	5741263552
20660007	8390647252-	3244721751	8356950952	2539640052
20660008	4384567252	8574761752-	7630197152	3713548152
20660009	3013771752	3164609052	4369935852	5155596451
20660010	2166148752	4070389051	2203141752	1051449051
20660011	6315013352	2045822252-	4629773252	3064895552

COEF	COSINE	SINE	MAX	PHI
30660000	1887062553-			
30660001	1240266754	222321854-	2544990454	2331656853
30660002	4448875853-	1859982353	4822035753	7865563752
30660003	5372278453	669504053	8256393953	1646901752
30660004	5906388352-	2528061352-	6499904952	5071152552
30660005	7678788353	3563333053	8462750453	4780092851
30660006	2877884553	9705751452-	3039078853	5687334852
30660007	7833273751-	1496746352	1249080752	1327764952
30660008	485774751-	3642900452-	3675172452	3280136252
30660009	6332255051	174475152-	1515843052	3277151752
30660010	4657514752-	1785794052	5024066852	1591771552
30660011	5775038552	1034797552-	5867008452	3180375252

COEF	COSINE	SINE	MAX	PHI
40660000	5600133353-			
40660001	1377373054	2574531854-	2747350854	2784908553
40660002	757177753-	1410071753	766726853	8245572152
40660003	6163747853	5827443753	8930421853	1917759052
40660004	7678878552-	8278400052-	8401906752	2541276852
40660005	1778762853	7477168852	1948747453	4527208451
40660006	3562777553	1527082753	3876477553	5613358852
40660007	3078752852	5037884752	5908818852	837472551
40660008	1896868075-	1175515552	2084106852	1816037752
40660009	1077343853-	2727773752-	103438853	214063052
40660010	1856421352-	6623275752	6497713752	1047028452
40660011	4872770852	2215288652	2212744752	6067263051

COEF	COSINE	SINE	MAX	PHI
50660000	3015087554-			
50660001	1267557854	2568110354-	2884971854	2962778253
50660002	9291588253-	1478838753	3277161453	6608167052
50660003	3523346253	4476877553	5897067453	1726587852
50660004	1248613553	7811771754-	1455524953	8188777652
50660005	7807148753-	5134348053	8865521253	4084473052
50660006	7351465051	4043573352-	4747868852	4716579252
50660007	1010784753	7350867452	1244553653	5147383551
50660008	5132165052-	8734254752	896873352	1591387252
50660009	3967228851-	5817801752-	5633787452	2959133152
50660010	1327878552-	2839119052-	3131534752	2448697152
50660011	4067123752-	1170174752	4232106952	1490445152

COEF	COSINE	SINE	MAX	PHI
60660000	3593281354-			
60660001	1140017754	2535318854-	2777835554	2942113353
60660002	9587894253-	2117212753	786716853	5577450952
60660003	2382893753	4480078853	5074356853	2066416452
60660004	2929650852	1716122353-	2094981853	7345337352
60660005	1110005854-	5016688853-	1213106854	4886413052
60660006	2632233853-	5531318852	2892722553	2802451852
60660007	7089572152	4245963352	8263740752	4416786151
60660008	1626843352-	1570775253	1083083153	1232987152
60660009	2201747752	6802480852-	8783949752	3204721752
60660010	1152828852-	3804075852-	1213887753	3061128752
60660011	4887902852-	3164732752	6167370752	1294359752

COEF	COSINE	SINE	MAX	PHI
70660000	4123497554-	1296213054-	1316539654	2800812353
70660001	2304525253-	1452142153-	8520013153	8509175152
70660002	8376058323-	3277028853	3326510953	2670173052
70660003	5716270052	2049110853-	2050712653	6693382452
70660004	8103700051-	6377061553-	1423700354	4132176152
70660005	2272980754-	3721908152-	6736727024	2406631252
70660006	1177606053-	9356250852-	1504045153	3120766452
70660007	1183059153	1263154853-	1730661853	3914058352
70660008	9841797552	6192023352	1162764553	3575142951
70660009	3118233351-	3297324252	3314031852	9539905551
70660010	5178054252	4470295852-	6640744852	2901776752
70660011				
COEF	COSINE	SINE	MAX	PHI
80660000	1902858554-	9080027752-	3629141253	1958270753
80660001	3487744053-	6279017252-	3622317553	8500889552
80660002	3567481353-	1262283853	1265719153	3140743252
80660003	7317016751-	17370031752-	1084610053	6045091552
80660004	2124123352-	3045661753-	2226442853	3165798552
80660005	1162670053-	2483510653	7750717153	1924388152
80660006	2503347552-	9292015852-	9333918152	3641761852
80660007	1771075052	1229021753-	1244726853	3400691052
80660008	4069558552	3149477452-	2136178452	3523030552
80660009	2561768552	8166675051	2608410552	1766437551
80660010	3747448552	5216882252	7768817752	3764217851
80660011				
COEF	COSINE	SINE	MAX	PHI
90660000	4334678354-	3221682252-	7375002753	2556161653
90660001	1602768353-	5747077553	7620163653	6448722552
90660002	4012173453-	5747337553	7374328353	8474768352
90660003	1556248153-	1271186753-	8007224552	3632123352
90660004	1271186753-	1792173553-	2676761053	6537473552
90660005	2426782753	6212571154-	6670160053	1477773552
90660006	6212571154-	1407407553-	4472717552	3063266052
90660007	25742790052	8008823552	9166472752	7237183051
90660008	4776165052-	3242707552	5746464552	1997338252
90660009	1267414453-	6627523552	1447601153	1527677552
90660010	3906649053	2414014752-	3857561552	2917684752
90660011				
COEF	COSINE	SINE	MAX	PHI
100660000	1577375054-	4547847053-	3787523853	2344824853
100660001	3246083053-	3367934252-	1163152453	1715993053
100660002	1179413553	2444773853-	2479215453	9383575152
100660003	4988217552	5768135952	3767713552	2269371452
100660004	1585821751-	6451747552	1627907853	4689395051
100660005	1487613753	1701400052	2475841052	8366554551
100660006	1585821751-	1701400052	2475841052	8366554551
100660007	8427727552-	4117353552-	6171353552	3976740952
100660008	4526518852-	4601818552-	5211747552	2756742652
100660009	3388740052-	4601818552-	5211747552	2756742652
100660010	3781191751-	4601818552-	5211747552	2756742652
100660011	6173770051-	1233836052	470017752	1044613552
COEF	COSINE	SINE	MAX	PHI
110660000	1587845452	5162735051-	3345112551	2850103053
110660001	1364344551	3178794754-	6707770849	1041417553
110660002	3906478474-	3684746050	3817614550	2504637552
110660003	1777175052	4524108354-	4763047449	7369770052
110660004	1777175052	4524108354-	4763047449	7369770052
110660005	2474744754-	1262283853	1344444474	1008134252
110660006	2474744754-	1262283853	1344444474	1008134252
110660007	4473583346	1727741747	3036722849	4339711151
110660008	6073787346-	1743077447	2102198747	1247289452
110660009	1482486744-	2317777447	2604050149	2356189352
110660010	1482486744-	2317777447	2604050149	2356189352
110660011	1482486744-	2317777447	2604050149	2356189352
COEF	COSINE	SINE	MAX	PHI
120660000	1884166750-	1076661851	1470752751	1327416653
120660001	1001975151-	7826831347	8766736049	5674634252
120660002	3415074247-	1394152450-	3778504050	6723867852
120660003	3510419150-	4330127847	5220508749	3079077652
120660004	2716651147-	1422421850-	2177431550	4415617052
120660005	1650746450-	166667447	6468394649	2751141552
120660006	6247486147-	1116445047-	140872649	4335632852
120660007	6247486147-	1116445047-	140872649	4335632852
120660008	4166704753	4330107447	4330110747	1056294652
120660009	2606166747	1018182449	2777777449	2371077551
120660010	717072048	3070720449	3001960449	2637267452
120660011	8375400048	4523877449	7534764848	3013242752

COEF	COSINE	SINE	MAX	PHI
130660000	2111741751	4940202291	3049233331	1208837053
130660001	2079712751	4940202291	3049233331	1208837053
130660002	1820184091	4111844750	4041037531	1706120053
130660003	1193000750	3086184249	1330305150	8753006351
130660004	6013046020	4117283750	1323274350	0130020052
130660005	4988044350	1014870050	3070028450	3027902452
130660006	6673417849	7011400849	3080774049	3773440352
130660007	1213422450	9240311749	1529197550	2038720452
130660008	2606253850	2014121350	3294060150	4028828552
130660009	1727592449	1691747350	1700945150	9352149551
130660010	9957292449	2704117350	2882553050	2497917652
130660011	1266107550	2178877549	1285060250	8956218550

COEF	COSINE	SINE	MAX	PHI
140660000	2328402752	5637242450	8423374550	4367000052
140660001	6112335050	5637242450	8423374550	4367000052
140660002	3177610751	4351208349	2178112651	3949297050
140660003	1490386751	1334473351	1004637551	1399722652
140660004	6398932550	1123117350	6476742650	3488741351
140660005	6481742550	3624830750	1466470650	4184317252
140660006	1273773550	6144481750	6275708250	4635117952
140660007	2712426750	1127247350	2716348250	3474747351
140660008	1750278449	1320470050	2476743050	0190614051
140660009	2431180050	4474471750	3423036550	3472333551
140660010	2073013350	4497450050	3120752050	3320057152
140660011	1412311750	6430737549	1679771752	1737026651

COEF	COSINE	SINE	MAX	PHI
150660000	2439773551	3637733351	7272227551	3124200053
150660001	2002327251	3637733351	7272227551	3124200053
150660002	1713077351	3043030050	1722092751	2717447551
150660003	1161767351	6041004750	1306717351	1073706652
150660004	1410672051	1704733350	1430077351	0720335552
150660005	3744473550	1704733350	1430077351	0720335552
150660006	5972773550	3637733351	7272227551	3124200053
150660007	1440773550	3637733351	7272227551	3124200053
150660008	1251473550	1327733350	1327733350	0130020052
150660009	1440773550	1327733350	1327733350	0130020052
150660010	1724473550	1216773550	1337333350	3106473552
150660011	1106647350	1216773550	1337333350	3106473552

COEF	COSINE	SINE	MAX	PHI
160660000	2333744051	6527744051	7274740751	3008176053
160660001	2070774051	6527744051	7274740751	3008176053
160660002	3047640751	1326377350	3021245651	1311544351
160660003	1036227351	1274473551	1647730251	1070062452
160660004	1113167351	1274473551	1647730251	1070062452
160660005	3634400050	4444447351	1367772250	4406577352
160660006	6737220050	4444447351	1367772250	4406577352
160660007	2013407351	4406400750	4406400750	3312336352
160660008	174473550	1037733350	1037733350	0130020052
160660009	290773550	1037733350	1037733350	0130020052
160660010	174473550	6477733351	1037733350	0130020052
160660011	1612773550	6477733351	1037733350	0130020052

COEF	COSINE	SINE	MAX	PHI
170660000	2059115551	3307447351	2080101251	3067733353
170660001	3707611551	3307447351	2080101251	3067733353
170660002	2690773551	4470773551	4470773551	1706244553
170660003	1590720050	4406400750	1273773551	1070062452
170660004	4474473550	4406400750	1273773551	1070062452
170660005	4430667350	8417333350	2427000750	4063476552
170660006	3737447350	8417333350	2427000750	4063476552
170660007	1147776650	3750366750	3716111350	0616167352
170660008	1277773550	1043167350	1000000750	0370427351
170660009	1147773550	2762730750	2447700750	1070062452
170660010	3737447350	4406400750	1273773551	1070062452
170660011	2059115551	3307447351	2080101251	3067733353

COEF	COSINE	SINE	MAX	PHI
180660000	321174064	3307447351	2080101251	3067733353
180660001	2470473551	2017447351	2074770453	1734740052
180660002	4764773551	3037447351	4765743253	1734773553
180660003	1497773551	1237073551	1000817253	1370563752
180660004	1374400751	4467773551	1332776553	0500747352
180660005	1070404750	3744773551	1160707353	0710012752
180660006	3270400750	3037447351	0100777352	4237341352
180660007	2664773551	1477773551	2427000750	3545707052
180660008	1760773551	3277773551	7777773551	0077773550
180660009	247773551	4467773551	1332776553	0500747352
180660010	1374400751	3744773551	1160707353	0710012752
180660011	4764773551	1237073551	1000817253	1370563752

IBM TAB NO. 11  
TYPE II STEADY STATE CONDITION NO. 67  
LEVEL FLIGHT, TRUE AIRSPEED 111 KNOTS

COEF	COSINE	SINE	MAX	PHI
10670000	4003885454-			
10670001	8348294254-	9698360054-	1279657055	3107216953
10670002	3212249584-	2832320254-	4282590954	1107017253
10670003	3222463352-	3027775053-	3044875153	8797496052
10670004	4310820053-	3318552552	4323574653	4389948752
10670005	8837250853	5490017453-	1040371554	6562999652
10670006	3257064753-	8621708352-	3369244653	3247109952
10670007	4931476753-	5249639353-	7202650653	3239856152
10670008	1915947552	1659136752-	2534480152	3988858852
10670009	8970484252	9956394252	1340146953	5331318951
10670010	3417763853-	1277700553-	3648784553	2004978252
10670011	5976927552-	4877691752	7714606152	1279843652

COEF	COSINE	SINE	MAX	PHI
20670000	9183675053			
20670001	2677300854	3424751454-	4347052154	3080165453
20670002	9282345853-	1735073553-	9443115253	9529383152
20670003	1907318153-	8615345853	8823947253	3416105252
20670004	1145645253-	5144524252	1255852053	3895438152
20670005	5580917153	3001153453-	6336683553	6634614752
20670006	1301221353	1584079253	2050011553	8433234151
20670007	8542912552-	3971965052	9421139052	2215203952
20670008	6364670852	1714794252-	6591627552	4311515052
20670009	4929527552	1856679252	5267589552	2293178351
20670010	1737669252	5187176752	5470493252	7147949951
20670011	2955189252	8007222551-	3061747752	3134904252

COEF	COSINE	SINE	MAX	PHI
30670000	4390454253			
30670001	2006955454	2871667254-	3503475854	3049490053
30670002	7966770053-	3881444153	8862089353	7701237552
30670003	2548845853-	1188954254	1215968054	3403325652
30670004	1116363453-	1148949353	1601983753	3354396952
30670005	3547906253	2260077553-	4206585453	6550054752
30670006	1650272753	1035465453	1948227053	5351043651
30670007	1377104852-	4957470852	5145185652	1507491952
30670008	1779691252	3642975052-	4054450452	3700459552
30670009	1692462852-	8304452551-	1885224052	2290399352
30670010	1037941752	3220248852-	3383385652	2878650352
30670011	1817510052-	4457106751	1871363352	1511101852

COEF	COSINE	SINE	MAX	PHI
40670000	6289000052-			
40670001	1964525854	3059465554-	3635889354	3027050953
40670002	9483210853-	6011790353	1122821954	7381387352
40670003	3146268753-	1442203354	1478123554	3410422352
40670004	9501348352-	8816144252	1296148253	3428556852
40670005	1244533453	4893592952-	1337286853	6770697952
40670006	1696665153	4411314252	1753074353	2429028151
40670007	6713524052	1084458053	1275446353	8319958651
40670008	3054017852-	2350437852-	3854080052	2719856952
40670009	3149222952-	1493028852-	3575465152	2314028652
40670010	2556537652-	2770623552-	3769867452	2273007152
40670011	2045762551	3390036952-	3396203952	2485940052

COEF	COSINE	SINE	MAX	PHI
50670000	2635616754-			
50670001	1634821754	2941907954-	3365629854	2990609853
50670002	1145992454-	4033710753	1214910254	8030437352
50670003	5791465453-	1616797854	1717395154	3656927652
50670004	1477451053-	9966669252-	1782191553	5350075852
50670005	2565798353-	2064247053	3293089353	2823649652
50670006	1866235852-	9331790852-	9516082452	4311503352
50670007	6150493152	2654787552	6698989852	3335267251
50670008	2954885852-	2693900051	2967140252	2184886052
50670009	8648160852-	6840091751-	8675168852	2050247652
50670010	5773801752-	1145922552-	5886418652	1912255852
50670011	8955475051-	1864220852-	2068169452	2221281652

COEF	COSINE	SINE	MAX	PHI
60670000	3215846354-			
60670001	1433112254	2996686354-	3321737354	2955586453
60670002	1250628354-	3564795353	1300441854	8204515652
60670003	5307670853-	1812385054	1888505554	3544099152
60670004	2163747953-	1775230253-	2798793953	5484172752
60670005	4104015753-	3254747353	5237969553	2831666752
60670006	7808972452-	7158296752-	1059345453	3708512352
60670007	1238875852	2967518352-	3215739152	4180850152
60670008	5043333352	3099629252	5919705452	3946857151
60670009	6141425852-	9607033351	6219235552	1899191552
60670010	6713975052-	1432150051	6715502352	1787780252
60670011	6100333351	7018150051	9298843751	4454736551



COEF	COSINE	SINE	MAX	PHI
70670000	4016536354-			
70670001	2381386553-	1608302854-	1625837654	2784224953
70670002	1228601254-	1047610052-	1228645854	9024427452
70670003	3744908453-	1424353154	1472761154	3491027352
70670004	3840885253-	2722791153-	4708077153	5383317752
70670005	5177625253-	2402589653	5707910353	3102142852
70670006	2009570353-	1555804353-	2541436653	3629115952
70670007	9625910052-	1991664353-	2212082353	3488643852
70670008	5996352552	4771907552-	7663376852	4018589652
70670009	1022267653	2413257552	1050366253	1475842751
70670010	6823475852	7511083350	6823889252	6306698349
70670011	3251530852-	6036749252-	6856733552	2197200752

COEF	COSINE	SINE	MAX	PHI
80670000	1879206054-			
80670001	4748744553-	2958304553-	5594831553	2119214953
80670002	5393094153-	1562690052-	5395357653	9032986652
80670003	1031364853-	5282529853	5382270353	3368249952
80670004	1990753353-	7852060852-	2140011153	5038140052
80670005	2700094253-	9965218352	2878118253	3194849052
80670006	6307305052-	5124726752-	8126802652	3651568252
80670007	6380427552-	1792347353-	1902526653	3577217352
80670008	7292876752	7852077552-	1071639753	3911067852
80670009	1031367753	2366612552	1058171953	1435951951
80670010	8202828352	1168416752	8285625552	8106718650
80670011	4502725051	1173948351-	4653244851	3139883552

COEF	COSINE	SINE	MAX	PHI
90670000	5173648354-			
90670001	5282653853-	8811323353-	1027355154	2390560553
90670002	2331278853-	3007609353	3805335153	6389011752
90670003	1044692154	8859847553-	1369799554	1065664453
90670004	1525403353-	1761379353-	2330088553	5727663352
90670005	8247211752-	2449711353	2584811553	2172127152
90670006	4576206153	3813491353	5956876553	6634245151
90670007	7189342552-	1476880753-	1642572153	3486336352
90670008	1271159453-	2201722553	2542327353	1499998752
90670009	7393468352	1309481053	1503786653	6727829851
90670010	4533009553-	8058790852	4604086953	1699192852
90670011	2162345852	2233824753	2244266153	7679180451

COEF	COSINE	SINE	MAX	PHI
100670000	1531110054-			
100670001	4630862153-	5981291753-	7564438853	2322520953
100670002	2358766453	8323900852-	2501330153	1702812453
100670003	3525843653	1588574453-	3867187953	1119153353
100670004	1283851453-	1070667053-	1671706453	5495660052
100670005	9286890852	7514360052	1194621153	7795515451
100670006	3170018352	1901976752	3696827252	5160550451
100670007	7689567551-	1077894553-	1080633853	3798850152
100670008	8023516852	7961372552-	1134577953	3942952152
100670009	4192436752-	3039763352-	5685095252	2472065652
100670010	2723362752	1186134952-	2970457952	3364649252
100670011	1018657552	9584560051	1398678352	3932357251

COEF	COSINE	SINE	MAX	PHI
110670000	1920173452			
110670001	2863941351	7339815151-	7878771951	2913153653
110670002	2927930850-	9584308349-	3080806550	9906269052
110670003	3121892550-	2390151750	3931798350	4752066052
110670004	1298157550	7783050049	1513595650	7736155351
110670005	1559623750	1597400049	1567782850	1169592951
110670006	1048537250-	9987333348	1053283050	2909316452
110670007	5489558348	1325491749-	1434670949	4178528952
110670008	9983500048	4323833349-	4437593649	3537518052
110670009	1261525049	2931333349	3191263149	7412772251
110670010	5312741749	4395266749-	6895186249	3203988252
110670011	3027558349	9665833347-	3029100949	3256103552

COEF	COSINE	SINE	MAX	PHI
120670000	6666666749-			
120670001	1098262951-	2390540651	2630753851	1146750253
120670002	2734228349-	6808176748	2817714949	8300890052
120670003	2330877750	1967219550-	3050072750	1066120753
120670004	3749981349-	1443372549	4018169249	3973705752
120670005	2077098349	9379411749-	9606648849	5649736052
120670006	1666682349	8333483348	1863410749	4427541551
120670007	3560555249-	1727423349-	3955287049	2940220652
120670008	8333256748-	7217125048-	1102406749	2761182852
120670009	4975490849-	1994493049	5360364849	1757288452
120670010	2317583349	1402491549	2708906649	3118033851
120670011	2976380849	4436239149-	5342196249	2762351252

COEF	COSINE	SINE	MAX	PHI
130670000	8778732151			
130670001	4229119351-	5181357251	6688192051	1292219653
130670002	2347099951	1195688051-	2634112351	1665021353
130670003	1091174651-	8722560850	1396958451	4712069752
130670004	9716442549	6773580350-	5843769350	6955322752
130670005	1944620150-	1592150250	2513262750	2813824652
130670006	2653292850-	2011859350-	3329795950	3619520452
130670007	1541053349-	4822074249-	5062335949	3603957252
130670008	1466314750-	5598758348	1469381750	2222704452
130670009	5673637547-	7319145049-	9260672049	2580199552
130670010	4067480849-	7120281749	8200171449	1197372952
130670011	4017549249-	2072475048-	4022891249	1663209352

COEF	COSINE	SINE	MAX	PHI
140670000	2411348352			
140670001	6121765650	4656421750	7691442050	3725784452
140670002	4913598851	2379590351	5459478351	1292014452
140670003	9879052550-	1187034351	1544346951	4325626852
140670004	1034281351	1741065850	1048833151	2388836951
140670005	2697620850-	7152875049	2790841150	3302989652
140670006	2468282850	2408273350-	3448506950	5261750552
140670007	1247196850	2413417550	2716631050	8953021451
140670008	1880465850-	2715708349	1897974350	2147279352
140670009	3095333348-	9986783349-	9991575149	2980274852
140670010	1226751750	1903833349-	1241436950	3511784752
140670011	5786333348	4434455849	4472048249	7505974151

COEF	COSINE	SINE	MAX	PHI
150670000	2708696352			
150670001	4412066951	4231620351-	6113341551	3161959453
150670002	5757215951	3539525251	6758237551	1579156052
150670003	1946642451-	6756964250	2060578151	5361922452
150670004	1677260851	1661920850-	1685474351	8858532652
150670005	3754926750-	1624674250	4091317550	3132071452
150670006	4078030250	3972375050-	5692951450	5262538052
150670007	4823941748-	3954952550	3955246650	1295697452
150670008	3096080850-	1817116749	3101408650	2208014052
150670009	5715450049	2566750048-	5721210649	3971429352
150670010	1191951750-	1737383349	1204547250	1717070052
150670011	3176425049	8800058349	9355784449	6377518251

COEF	COSINE	SINE	MAX	PHI
160670000	2767713552			
160670001	4844513151	6475826151-	8087374851	3067998753
160670002	4150003951	3318988351	5313964251	1932563352
160670003	2121633851-	7963408349	2123127851	5928348552
160670004	2716910351	2304634250-	2726667491	8878786752
160670005	2772792550	1084536651	1119421051	1513172452
160670006	3583946150-	4321158349	3609902250	2885417552
160670007	1430072550	1123250048	1430116650	6428861049
160670008	3985650049-	1958342550	1998489350	1268797752
160670009	1573485850	2271610850-	2763344650	3385659452
160670010	7805531750	4594700049	7819043350	3368809550
160670011	2019350050	5983853350	6315399750	6486561851

COEF	COSINE	SINE	MAX	PHI
170670000	2402293252			
170670001	4864299651	7978634051-	9344517851	3013692353
170670002	6368272751	2704063351	6918587651	1150340052
170670003	1442509351-	2675133751	3039271951	3944494352
170670004	8916280050	1719981750-	9080660050	8727038852
170670005	5502620849	3095450850-	3143979050	5601597652
170670006	1323110650	2787536750-	3085608950	4076809052
170670007	1246468350	1878320850-	2254278650	4336693852
170670008	1977441750-	2449006750	3147683250	1611487752
170670009	7053333348	1734333350-	1735767050	3025876352
170670010	2434150850	2561283349-	2447589050	3539932852
170670011	1637750850	1134096250	1992084850	3154682651

COEF	COSINE	SINE	MAX	PHI
180670000	3435734754			
180670001	9378560852-	1803369753	2032662453	1174770353
180670002	7502590253	1993839353	7763005553	7441278551
180670003	2360825153-	1949677353	3061619253	4681618352
180670004	1529368353	5312817552-	1619020653	8521086852
180670005	3579446752-	3086456752	4726378552	2784594552
180670006	4719624751-	4241535852-	4267713152	4394178852
180670007	9943258351	1645671752	1922737452	8408478351
180670008	3297250052-	8293766751	3399959452	2073512152
180670009	1556358351-	1753377552-	1760291352	2943639952
180670010	1541880852	5248600051	1628764752	1879870151
180670011	2495291751	1366925852	1389514652	7241335751

IBM TAB NO. 12  
TYPE II STEADY STATE CONDITION NO. 68  
LEVEL FLIGHT, TRUE AIRSPEED 110 KNOTS

COEF	COSINE	SINE	MAX	PHI
10680000	8932581354-			
10680001	7680348354	6962796354-	1037261955	3178350853
10680002	2837109654-	3200010854-	4276594454	1142200053
10680003	1945966053-	5230253353	5580531753	3680273552
10680004	2825985153-	2405899853	3711407553	3489765552
10680005	4326354753	6612980153	7902458553	1136128352
10680006	4789789853-	1149560353-	4925807053	3224931052
10680007	3330563953	1960347853-	3864663053	4707417352
10680008	2059619053	4148158352	2100976653	1423408751
10680009	2216668352	2356367353	2366770653	9402879851
10680010	1325600553-	4746903352-	1408029753	1997021752
10680011	1198029953-	4463150952	1278465053	1450614452

COEF	COSINE	SINE	MAX	PHI
20680000	1234887553			
20680001	2413068954	2679007754-	3605549154	3120103953
20680002	6974953853-	1554251853-	7146025553	9628108952
20680003	2638530653-	6506574253	7021207353	3735780952
20680004	6364705852-	2204808352	6735774652	4022333152
20680005	2877479153	2859233853	4056489153	8963552251
20680006	2828984551-	7637614252	7642851852	1535354652
20680007	1860650352	2066208351	1872087552	2480905852
20680008	1838681752	2450108351	1854934152	9487688450
20680009	6018387552	2258530052-	6428214852	3771447952
20680010	1293780052	1115435152	1708560252	4077903751
20680011	1752740852-	1334429152-	2207847052	1975285052

COEF	COSINE	SINE	MAX	PHI
30680000	1138441753			
30680001	1829297354	2528562954-	3120890754	3058839853
30680002	5319916353-	3198706553	6207256653	7449336652
30680003	2419414053-	8096321753	8450088153	3554588852
30680004	1941513552-	4483709252	4886013052	2835333552
30680005	1703955553	1603438953	2339760853	8651844751
30680006	1876781753	1488481753	2395388853	6403008551
30680007	7870508752-	2023290052	8126414352	2365471752
30680008	2588678852-	1120894452-	2820932952	2542656952
30680009	3981208351-	3168471352-	3141385452	2920425352
30680010	5156639251-	6200782352	6222192952	4675384251
30680011	3345556752	4570852552-	5664401452	2783651152

COEF	COSINE	SINE	MAX	PHI
40680000	1867466753-			
40680001	1778435554	2806479354-	3322523054	3023619953
40680002	6174799553-	4776758153	7930403153	7056736852
40680003	2263297453-	7513633353	7781093653	3445974352
40680004	1357353752-	5284691752	5461066552	2609794952
40680005	5402151452	7927895052	9593474852	1114581352
40680006	1832398353	6107975052	1931516853	3072482551
40680007	7596926852-	4465406352	6914070652	2120602052
40680008	6447344852-	2571000042	6447344852	2249996952
40680009	2477612552-	6216468351	2133002252	1796144652
40680010	2385997752-	2155432752	2155412152	1770633752
40680011	2161899452	2405902852	3621788452	4850174851

COEF	COSINE	SINE	MAX	PHI
50680000	2648058354-			
50680001	1442030954	2833400754-	3179247254	2969733753
50680002	7989957551-	2438544353	8353796753	8151387552
50680003	3731960853-	1107147254	1168353654	3620929652
50680004	3421495852-	1993335753-	2022487053	6506507152
50680005	1820554053-	1573489353-	2401701253	4416731652
50680006	5598731752-	6220411751	5633181452	2894336952
50680007	5359731751	1744725051	6537752051	4990565451
50680008	4354600852	2154970852	4858646652	3291191051
50680009	1249478352-	2504480052-	2798859852	2705394752
50680010	5014737552-	4167802552-	6520595852	2197203452
50680011	2506375051-	5371645352	5377489452	8424677051

COEF	COSINE	SINE	MAX	PHI
60680000	3193070054-			
60680001	1301403854	2916130654-	3193347854	2940501453
60680002	8253841053-	1709958553	8445911653	8387873652
60680003	3638052753-	1148732254	1252243954	3562975352
60680004	1024935553-	2676936453-	2866440553	6226233952
60680005	3050519853-	7787205453-	4122052153	4448347952
60680006	1496722651-	6507546752-	1632072352	3391645952
60680007	2817437552	4506876752-	4576861252	4399918452
60680008	1138785852-	8453616751	7418262852	1792652252
60680009	3192375052	7359273351	5276101552	1442372151
60680010	8693491751	2942409252-	3068149352	2864600452
60680011	6792416752-	4190944852	8034247452	1342694152

COEF	COSINE	SINE	MAX	PHI
70680000	3961435054-			
70680001	1492231153	1594427454-	1601395154	2753467753
70680002	8222982353-	1357213653-	8334234653	9468612452
70680003	1218643353-	1012539854	1019846954	3228761252
70680004	2479560353-	2554372053-	3559920853	5646286052
70680005	4270298653-	4072312853-	5900178153	4472810552
70680006	2398520053-	8427290052-	2542260953	3322652052
70680007	1612013653	6947145852-	1755339353	4809798052
70680008	1118235253	1403495852	1127008453	8942224650
70680009	1348299953	1423440852	1355792953	6696182450
70680010	7032921752	1000663153	1223088953	2467944751
70680011	4529689252	3281259252-	5593276952	2946189352

COEF	COSINE	SINE	MAX	PHI
80680000	1814161754-			
80680001	4802453853-	2261513353-	5308295953	2052161253
80680002	4432945153-	1120285053-	4572312453	9709136652
80680003	7489959252	3279170553	3363622253	2571126052
80680004	1261468053-	9559037552-	1582736153	5428844952
80680005	2319072753-	1426821853-	2722850853	4232042852
80680006	1576830953-	7884179252-	1762951653	3442752252
80680007	4338448352	758777552-	8740162052	4282297852
80680008	6701563352	6627966751-	6746657352	4427280452
80680009	7489973352	2687058352-	7957385452	3700714952
80680010	6879705052	4501246752	8271408852	3319588351
80680011	4591850052	9128675851	4681710552	3170510052

COEF	COSINE	SINE	MAX	PHI
90680000	4309255054-			
90680001	6581879853-	1202389354-	1370747654	2413036953
90680002	5981160353-	1769865852-	5983778453	9084747852
90680003	1210847554	4637894353-	1296631154	1130139153
90680004	2160987453-	2201742752-	2172174853	4354561152
90680005	1237203153	3740498853	3990674953	1438787052
90680006	8698162553-	1525395053	3027163753	2337874152
90680007	6239110852	1453440753	1581822353	4189002252
90680008	1906747653-	6603200852-	201709353	2466834252
90680009	6031961352	2480634453	2552918753	8461453651
90680010	1137364453-	2465076553	2714611253	1147681952
90680011	3639132552-	3422954252	4995991952	1243211952

COEF	COSINE	SINE	MAX	PHI
100680000	1535865054-			
100680001	4635496553-	6757684153-	8194761953	2355514753
100680002	2167428553	9170246353-	2353440253	1685335553
100680003	4195389953	3048308350-	4195391653	1199824953
100680004	3170016452-	1153027553-	1195608553	6365686652
100680005	4761408751-	1510776653	2511147153	1836112752
100680006	6340192851	2218476752	2707777752	1234233052
100680007	6078697652	7724140052-	963327152	4402638752
100680008	1902019852	5470087551-	1974687652	4298725352
100680009	1158104152	1304400052-	1744674452	3461714852
100680010	1386267851-	4777790052-	4974836752	2538200852
100680011	1444180852	2636547551-	1465311452	3144171852

COEF	COSINE	SINE	MAX	PHI
110680000	1824010352			
110680001	2595927751	6999927351-	7465776851	2903473353
110680002	1600390050-	5358268744-	1687708050	9925553752
110680003	3813375050-	1719330050	4183660250	5191021652
110680004	1148089250	1810678050	2261733750	1335325652
110680005	8423124749	2186641744-	702373149	6908920052
110680006	1098466750-	4493463349-	1186820450	3370759052
110680007	8326944749-	5788233349-	1014108750	3088628252
110680008	7489175049	2594566749	7925676549	2386531051
110680009	9774925049	3776675049-	5921820549	3751405252
110680010	3021791749	3628416749-	4721931149	3037679752
110680011	5685833347-	1378286744-	1379459049	2433076252

COEF	COSINE	SINE	MAX	PHI
120680000	2916666749-			
120680001	3855200450	1917329751	1955704251	7863105552
120680002	4512552849-	3567576849-	5752454949	1091647753
120680003	2335065850	2664216150-	3542679850	1037443753
120680004	3333337849	6916666743	3333337849	2972214646
120680005	1254504950-	1424451549	1262566150	3470439852
120680006	8333263748-	8333716748-	1178498249	2749997552
120680007	7877480749-	3710770349	4707710449	2211099652
120680008	5416669849	3608456149-	6508553449	4072117552
120680009	3315991249	1642138849-	3700326749	3707272952
120680010	9041055048-	1484249349	1737530649	1213465852
120680011	2038652548	8053317749-	2055897749	2467728252

COEF	COSINE	SINE	MAX	PHI
130680000	9014830051			
130680001	3964848851-	5492091251	6773705951	1258262753
130680002	1881794951	1050476851-	2155145851	1654141953
130680003	1334573551-	5966165050	1461861051	5197104752
130680004	1175403850	7774172150-	1862526750	6964940952
130680005	1898414850-	7693875849	2048398450	3158766552
130680006	1793740050-	2324997350-	2936514250	3872495852
130680007	4598425049-	1533308349-	4847323649	2834865152
130680008	1760667050-	5807110849-	1853961650	2478172852
130680009	8034775048	5558509249-	5616280049	3091389952
130680010	1653885049-	5062319249	5325637249	1080924852
130680011	2857248349-	6377875048	2927565749	1521971652

COEF	COSINE	SINE	MAX	PHI
140680000	2384049952			
140680001	1391929151	8860993350	1650042051	3248075152
140680002	1780593251	2624866651	4602478851	1738612952
140680003	1677619151-	2669440850	1498725051	5698626252
140680004	8827803350	1182163350-	8906605550	8809317352
140680005	5467171747-	3625550049-	6560074649	4271006352
140680006	3076302950	1933275850-	3657504650	5466597152
140680007	1090024350	9681866749	1457722650	5944611451
140680008	1153794250-	1583491749	1208352450	2034361252
140680009	2251583349-	6895775049-	7254058849	2799081152
140680010	8409508349	4337491749	9462223049	272837051
140680011	5996666748	3107732549	3167057449	7188950851

COEF	COSINE	SINE	MAX	PHI
150680000	2679907352			
150680001	5615530451	2571481851-	6176301651	3353958653
150680002	3507000751	3726811351	5116067551	2337840652
150680003	2901024351-	7482422550-	2975955151	6482089952
150680004	1868158751	7094741750-	1994374351	3480126152
150680005	2914702250	7221031250	4076313250	4774706051
150680006	1697002750-	7674098349-	1676708450	3414652752
150680007	1007094250	4370191151-	4445564650	4043967052
150680008	4476800850	704516749	4444561050	1129665051
150680009	1464440850-	1371274250	1766453950	1520961152
150680010	4392083349	1592315850-	1592758250	2715601552
150680011	9536291749	1706425650	2131635050	5765903551

COEF	COSINE	SINE	MAX	PHI
160680000	2668896235-			
160680001	6123499951	5561306451-	8271963551	3177545653
160680002	3457126051	3614470551	5004755451	2313711952
160680003	3041692551-	1347720650-	4044652551	6084222852
160680004	1451171551	4035425550-	1505163251	8612001552
160680005	5198736750	2564363350-	5796791750	6674887952
160680006	8769653350	2778700649	8770544450	4024721250
160680007	1104720850	8172850050	4247174450	1175743052
160680008	6795642750-	2621670049-	6490758450	2277618252
160680009	1254927750	3774774250-	1442523350	5211126152
160680010	8234916749	216216749	1127816750	467920751
160680011	1175577550	2337221350-	1516215950	2597286652

COEF	COSINE	SINE	MAX	PHI
170680000	2150884452			
170680001	5921290951	8553479251-	1040306252	3046935853
170680002	5931086351	2536425551	6450677051	1157698952
170680003	2287107851-	1471722551	1720177851	4906791352
170680004	7664988350	1516546750-	1813575450	8720209252
170680005	5431077549	1601560850	1881644850	1464475452
170680006	4642096850-	5132758350-	6920568750	3777893752
170680007	4148967549	1186110050-	5213030250	3963132752
170680008	4000868350-	92597025049-	4796607650	2412878952
170680009	5306416748	1594965050-	3475356650	2990603852
170680010	6838087349	2368076750	2464828850	7389334251
170680011	8761433349-	1124218850-	1475311450	2109719552

COEF	COSINE	SINE	MAX	PHI
180680000	3389009554			
180680001	3086909252	2691556853	2709200653	8345741152
180680002	5822703451	2319499451	6267691253	1086004152
180680003	3410093353-	6835914252	3477935253	5622155552
180680004	1306318451	9226866752-	1599318153	8119136352
180680005	5648116751-	4584975051	1027633352	2466824252
180680006	6726791151	1707443352-	1759275152	466303252
180680007	7015683351	2810875051	7557812451	3119114151
180680008	2706810852-	7688316751-	2720177852	2120897752
180680009	1994633351-	1582673352-	1575192752	2940188152
180680010	5961400051	8021025051	7773754651	5337946451
180680011	3048666750	1673314251	1700859851	7243122851

IBM TAB NO. 13a  
MANEUVER CONDITION NO. 34 - SYMMETRICAL PULL-UP  
REVOLUTION I

PER CENT		PER CENT		PER CENT		PER CENT	
CHORD		CHORD		CHORD		CHORD	
TIME		TIME		TIME		TIME	
4	0	2105400051	2701930051	3052830051	3438820051		
	1	3614770051	5263370051	5894970051	7421270051		
	2	1333420051	4761700050	5965500050	7281550051		
17	0	1072670051	1290780051	1363500051	1636200051		
	1	1836180051	1818000051	1999860051	1181700051		
	2	5999400050	1999600050	3817800050	7453800050		
34	0	5400000050	6600000050	6240000050	7920000050		
	1	8880000050	9240000050	9880000050	5880000050		
	2	3360000050	5240000050	1440000050	3240000050		
63	0	2287800050	2677400050	2590100050	3380300050		
	1	3819300050	4302200050	4258300050	2502300050		
	2	1712100050	1712100050	5707000049	1799905050		
90	0	9574000049	1081500050	1050600050	1328700050		
	1	1575900050	1730400050	1730400050	1328700050		
	2	1236000050	4615000049	3708000049	1019700050		

TIME	PER CENT CHORD	K	75	DELTA PER CENT	PRESSURE RADIUS	90+11201K
			11201K	D F G 30+11201K	W F E S 60+11201K	
2	0	0	8820790051	7405690051	5566760051	4717000051
	1	0	5707570051	6462290051	6839650051	60844930051
	2	0	6132100051	6167950051	5130210051	6698140051
9	0	0	5211510051	4787810051	4406480051	3770930051
	1	0	4575960051	4957290051	4109890051	3728560051
	2	0	3728560051	3728560051	3220120051	4025150051
17	0	0	3295560051	3039870051	2215980051	1733010051
	1	0	2244390051	2443260051	2613720051	2329620051
	2	0	2386440051	2386440051	2045520051	2500080051
23	0	0	3266660051	3264660051	2720550051	2461450051
	1	0	2720550051	2772370051	2746460051	2331900051
	2	0	2254170051	2202350051	1995070051	2461450051
34	0	0	2102340051	1931880051	1477320051	1250040051
	1	0	1534140051	1647780051	1676190051	1392090051
	2	0	1420500051	1367680051	1193270051	1534140051
63	0	0	9550900050	7563800050	5833100050	5640800050
	1	0	6538200050	7820200050	7692000050	6922800050
	2	0	6796600050	6025600050	5320300050	6922800050
90	0	0	3834000050	3550000050	3443500050	3479000050
	1	0	3940500050	4544000050	4189000050	3479000050
	2	0	3301500050	3017500050	2414000050	3124000050



TIME	CAMEL 14		K	85	DELTA PER CENT	PRESSURE RADIUS	90+(120)K
	PER CENT CHORD	(120)K		D E G 30+(120)K	R E E S 60+(120)K		
2	0	9792820051	8133020051	5228370051	4149500051		
	1	4149500051	5643320051	6888170051	6888170051		
	2	7801060051	8796940051	7884050051	9377870051		
4	0	1004457052	8266770051	5244510051	4000050051		
	1	4000050051	5511180051	6577860051	6044520051		
	2	6577860051	7733430051	7200090051	8533440051		
9	0	6095610051	6095610051	4177890051	3150540051		
	1	3219030051	4451850051	4588830051	4177890051		
	2	4451850051	4725810051	4246360051	5479200051		
13	0	4676300051	5509700051	3796600051	3055800051		
	1	3287300051	3657700051	3472500051	2963200051		
	2	3241000051	3565100051	3287300051	3981800051		
17	0	4311760051	4117680051	3823560051	3137280051		
	1	3333360051	3137280051	3333360051	2549040051		
	2	2745120051	2941200051	2745120051	3529440051		
23	0	3421080051	3355290051	3815820051	4714950051		
	1	2960550051	2631600051	2763180051	2478090051		
	2	2587740051	2675460051	2543880051	3026340051		
34	0	2183650051	1890050051	1394600051	1339550051		
	1	1266150051	1651500051	1743250051	1669850051		
	2	1724900051	1816650051	1633150051	2000150051		
47.7	0						
	1						
	2						
63	0	8472800050	6664000050	2665600050	2380000050		
	1	2475200050	4664800050	5997600050	6283200050		
	2	7520800050	7711200050	6854400050	8282400050		
77	0	3412800050	1516800050	1422000050-	1327200050-		
	1	9480000049-	7584000049	2180400050	2749200050		
	2	3792000050	3981600050	3033600050	3697200050		
90	0	9430000049	5658000049-	2640400050-	2829000050-		
	1	2640400050-	1508800050-	4715000049-	9430000048		
	2	8487000049	1037300050	4715000049	8487000048		

TIME		PER CENT CHORD		90	DELTA PER CENT	PRESSURE RADII
		K		11201K	D E G 30+11201K	R I F S 60+11201K
2	Q			1047618051	7830680051	4761900051
	1			3597880051	5396820051	6772480051
	2			8359780051	9947080051	9417980051
9	0			7373600051	5253690051	3225950051
	1			2119910051	3702460051	4331990051
	2			4331990051	4792840051	4147650051
17	0			5206960051	6508700051	4260240051
	1			3313520051	3668540051	3668540051
	2			3905220051	4378580051	4141900051
23	0			3725520051	4362780051	5392200051
	1			4460820051	2647080051	2549040051
	2			2745120051	2892180051	2843160051
34	0			2074240051	1777920051	1111200051
	1			6296800050	1111200051	1333440051
	2			1666800051	1814960051	1629760051
63	0			6913200050	4115000050	6584000049
	1			1481400050	1950400050	5102600050
	2			7571600050	7407000050	6254800050
90	0			3540000049-	1858500050-	3186000050-
	1			1947000050-	4540000049-	4425000049
	2			1416000050	1416000050	6195000049

		95		DELTA PER CENT	PRESSURE RADII	
PER CENT CHORD	K	11201K	D E G 30+11201K	K E E S 60+11201K	90+11201K	
TIME	2	0	8461200051	5769000051	3557550051	2692200051
		1	2403750051	3749850051	4999800051	5480550051
		2	6634350051	8653500051	7980450051	9230400051
	9	0	7368130051	4880190051	2966390051	2487940051
		1	2009490051	3345150051	4018980051	4114670051
		2	4593120051	5071570051	4784500051	5932780051
	17	0	4315660051	5263000051	3473580051	2526240051
		1	2210460051	2842020051	2947280051	2736760051
		2	3263060051	3789360051	3473580051	4105140051
	23	0	3196100051	4794150051	4072450051	2886800051
		1	3144550051	2319750051	1958900051	1958900051
		2	2319750051	2680600051	2525950051	2989900051
	34	0				
		1				
		2				
	63	0	6011400050	3355200050	1398000049-	8388000049
		1	1957200050	4333800050	5312400050	5871600050
		2	6850200050	7409400050	6011400050	7129800050
90	0	8265000049-	8265000049-	1392000050-	7830000049-	
	1	3045000049-	3915000049	7830000049	1000500050	
	2	1087500050	8265000049	4350000048	3915000049	

		HARMONIC		ANALYSIS	
COEF	BLADE	LOADING	40	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
		9069747551			34100
1		2729902851-	4633944551	5378272151	1705027753
2		1704687851	1226125049-	1704731951	1797939553
3		1058754550-	2242333347	1058756750	5995955252
4		6767497550	7201231749	6600731550	1519598151
5		1456541050-	1021180350-	6043441950	3794562752

		HARMONIC		ANALYSIS	
COEF	BLADE	LOADING	55	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
		1759878852			34200
1		2806077551-	5540712551	6210762151	1168598053
2		3036815351	4121745050	3064659051	3864645351
3		2944063750	1281712051	1315064751	2568789452
4		2773764850	9969655050-	1034832151	7138692152
5		9275833348	1429828050	1432833650	1725764152

		HARMONIC		ANALYSIS	
COEF	BLADE	LOADING	75	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
		2340576552			34300
1		1103314751	1060791751	1530549751	4387432852
2		359357851	4286886750	3619017551	3401456251
3		1746552751	1689206051	2429786751	1468125252
4		7531458350	2774236750-	8028037350	8494587552
5		1454230050	4080350050-	4331748050	5792319752

		HARMONIC		ANALYSIS	
COEF	BLADE	LOADING	85	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
		2277537552			34400
1		3740616751	2315505351-	4399292651	3282417953
2		2889201751	7286751750	2979673551	7077581551
3		8237088350	1035886551	1323464051	1716974452
4		1216655751	4360546750-	1292439251	8507047752
5		4048498350-	1614046750	4358381050	3165278652

		HARMONIC		ANALYSIS	
COEF	BLADE	LOADING	90	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
		2460183952			34500
1		4919511851	5593865351-	7449357451	3113299453
2		3294488251	1022326051	3449464251	8619926151
3		1233888751	7630708350	1567243351	1265754552
4		1474920351	3622433350-	1519483251	6652236952
5		2426253350-	4005658350	4084017150	2423944652

		HARMONIC		ANALYSIS	
COEF	BLADE	LOADING	95	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
		1752604952			34600
1		3838156551	5034726251-	6330865051	3073196453
2		2569538351	2003901750	2577340451	2229645651
3		8764498350	1068339551	1381871551	1687835152
4		7017921750	3606910050-	8609860650	8180827352
5		3392901750-	5396383349-	3435546350	3780743252

			HARMONIC	ANALYSIS		
RED BLADE	BEAM	BENDING	15	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		6092300054-				34210
1		5912726754-	6120823754-	8510277354	3140092853	34211
2		1723515354-	8780060853-	1934269854	1034977753	34212
3		2027668053	6083005753	6412050853	2385501852	34213
4		3041506253-	1756012853-	3512028053	5249999652	34214
5		2400704054	1254423254	2708681854	5517621251	34215
RED BLADE	BEAM	BENDING	28	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1839916753-				34220
1		1839820554-	2535852054-	3132967454	3059617753	34221
2		5299496353-	1466666747-	5299496353	9000001152	34222
3		4416253353	7360420353	8583651953	1961874652	34223
4		2944165052	1529833053-	1557905753	7022335252	34224
5		1074903654	2688437753	1108013954	2808431551	34225
RED BLADE	BEAM	BENDING	36	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		5948750053-				34230
1		1359985354	2369042354-	2731651854	2998586553	34231
2		5076245753-	8508692352	5147062153	8524233552	34232
3		5567502753	9170002753	1072781654	1957875552	34233
4		8187501052-	1418116053-	1637499553	5999999852	34234
5		7360140053	2402923853	7742461153	3616144351	34235
RED BLADE	BEAM	BENDING	45	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		8688000053-				34240
1		1438861854	2621070854-	2990039454	2987650153	34241
2		7796996053-	1553649153	7950281353	8436535552	34242
3		5658003353	8694002253	1037297854	1898138952	34243
4		6900206351-	3585357052	3651152352	2522342052	34244
5		1481373553	1113291953-	1853074853	6461482952	34245
RED BLADE	BEAM	BENDING	60	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		3275866754-				34250
1		1397635054	2667711254-	3011655154	2976504053	34251
2		8745327553-	8655628352	8788057453	8717380552	34252
3		1499201653	8245599253	8380782253	2656504752	34253
4		9994605052	8333333346-	9994605052	8999998852	34254
5		7229965053-	3308894353-	7950342453	4091575252	34255
RED BLADE	BEAM	BENDING	65	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		3974076754-				34260
1		1156188454	2709387354-	2945768354	2931096153	34261
2		9656435353-	1459266553	9766074053	8570328652	34262
3		1166551353	8943548053	9019306753	2752286052	34263
4		1879433753	3367553352-	1909365153	8746039852	34264
5		1156190054-	2847584353-	1190740454	3876720652	34265
RED BLADE	BEAM	BENDING	80	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4413804254-				34270
1		1070783053	1260207854-	1264748854	2748566953	34271
2		9000827353-	1781703053	9175475953	8440156052	34272
3		1285838352-	6686328753	6687565053	3036723952	34273
4		2185909853	6681356752	2285739953	4249017251	34274
5		1251471354-	3470847353-	1298710254	3910017952	34275
RED BLADE	BEAM	BENDING	92.5	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1977500054-				34280
1		4259471553-	1957955853-	4687930053	2046868853	34281
2		3958331053-	5484831752	3996150453	8605554652	34282
3		3166660052	2533330753	2553045653	2762499652	34283
4		9499976752	2742398352	9887886852	4025516351	34284
5		5082199753-	1683714053-	5353844153	3966596952	34285

				HARMONIC		ANALYSIS		
WH.	BLADE	BEAM	BEND	15 0/0 R	SINE	MAX	PHI	
	COEF			COSINE				
	STEADY			6583541754-				34410
1				3077549054-	3651671854	4775564454	1301234653	34411
2				1536499954-	1330647854-	2032598254	1104467053	34412
3				5487508353-	1024334554-	1162062354	8060713552	34413
4				1463341253-	6336341752	1594634753	3914678852	34414
5				2190451754-	1164006554-	2480522154	4159723852	34415

WH.	BLADE	BEAM	BEND	2 0/0 R	SINE	MAX	PHI	
	COEF			COSINE				
	STEADY			2113133353				34420
1				1310374354-	2196364854	2557557354	1208207553	34421
2				5964818553-	2402658852	5969655653	8884667552	34422
3				3884069053-	8877869053-	9690332853	8212353752	34423
4				1387168552	7207922352	7340189452	1977664652	34424
5				1214268354-	2543316053-	1240617654	3836594852	34425

		HARMONIC		ANALYSIS	
RED BLADE	CHORD	BENDING	15	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		5367541755			34110
1		1863177755	9668881854-	2099119855	34111
2		1122908254	1166968754	1619487054	34112
3		3144160754-	8084945054-	8674840654	34113
4		2245821753	1166962754-	1188376754	34114
5		4707603054-	1111110554-	4636950654	34115
RED BLADE	CHORD	BENDING	28	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		5034525055			34120
1		1469403255	9084635354-	1727556655	34121
2		2944156854	1529832854	117899854	34122
3		2944161054-	6477160354-	7114892154	34123
4		1766499754	5097506753	1838632954	34124
5		4683858754-	4255245053-	4774424454	34125
RED BLADE	CHORD	BENDING	60	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		2486970055			34130
1		3730647754	2425413254-	4449927454	34131
2		1266508354	6647431152	1768251654	34132
3		1151172054-	2840055854-	3064567654	34133
4		1727062354	5647183352-	1728341054	34134
5		2118920054-	2056566854-	273204254	34135
RED BLADE	CHORD	BENDING	80	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		1657983855			34140
1		1068035854	1066979054-	1523884454	34141
2		4311516753	2036673353-	4768155553	34142
3		2351730053-	6271316753-	6697764353	34143
4		787937833	6788750052-	4718442453	34144
5		9328586753-	4512018153-	1264291754	34145
WH. BLADE	CHORD BEND	15 0/0 P			
COEF		COSINE	SINE	MAX	PHI
STEADY		5485223355			34430
1		2236843555-	1360208755	2617945155	34431
2		1457860054	1500000048	1457860054	34432
3		400118354	8018269754	8764699654	34433
4		1457874854	1262546154-	1228580354	34434
5		414117854	4765880054	4758606154	34435
WH. BLADE	CHORD BEND	28 0/0 P			
COEF		COSINE	SINE	MAX	PHI
STEADY		5098937555			34440
1		1554906555-	9531403054	1823790255	34441
2		1559668854	2078018154-	1573451154	34442
3		2197504054	6458553754	7360644954	34443
4		1559681054	2078056153	1573465754	34444
5		5231227254	2466104054	578373854	34445
		HARMONIC		ANALYSIS	
RED BLADE	TORSION	15 0/0 P			
COEF		COSINE	SINE	MAX	PHI
STEADY		3655198354-			34350
1		5111207553-	1241962354-	1343024554	34351
2		4633341053	4458441553	6430051353	34352
3		3088903253	6177802053-	6906993653	34353
4		5148183352-	2675063553	2724151753	34354
5		2022299253	6401683351	2023312253	34355
RED BLADE	TORSION	50 0/0 P			
COEF		COSINE	SINE	MAX	PHI
STEADY		1375780054-			34360
1		3717841253-	5010713353-	6239358253	34361
2		1014401553	4392480052-	1105418153	34362
3		3803985752	2789601053-	2815417753	34363
4		5072013352-	8784955052	1014400153	34364
5		6746383352	6995115252	9718298552	34365

		HARMONIC		ANALYSIS		
RED BLADE	PITCH	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1659496452				34510
1		1600901551	5361462351-	5595369951	2856253253	34511
2		1164720050-	3362216749	1212277950	8194903752	34512
3		1747073350	2717656750	3230777550	1908821752	34513
4		9705916749	6724200049-	1180761250	8132150552	34514
5		8791500049	1556683349-	8926254949	6999178052	34515
RED BLADE	FLAP	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		5320000049-				34520
1		1143458751-	1029294851	1538488151	1380077653	34521
2		8865611748	4607261749	4691804349	3955334252	34522
3		3369334550-	1950668250-	3893266150	7002286952	34523
4		2659984249-	7678750049	8126421049	2727663252	34524
5		2220076350-	1071615550-	2465177250	4115325852	34525
VERTICAL	ACCEL	COSINE	SINE	MAX	PHI	
COEF		1013195051				34530
STEADY		2130522349	2019058049-	2935254849	3165386953	34531
1		1674764749-	9669173348-	1933847449	1049999053	34532
2		8120116748	1014990049-	1299833749	1028868353	34533
3		1167243849-	1142730049	1633490149	3390200452	34534
4		5065055048-	9057466747	5145401748	3397227752	34535
5						
FORE-AFT	ACCEL	COSINE	SINE	MAX	PHI	
COEF		1167766750-				34540
STEADY		1167553849	2458985048-	1193167249	3481067553	34541
1		3027580549-	4484135549	5411638349	6202191452	34542
2		5508320048	1432167849-	1534444749	9701248152	34543
3		1377084549-	1240293849-	1853291849	5550207752	34544
4		5951108348	1357308348	6103931248	2569610751	34545
5						
LATERAL	ACCEL	COSINE	SINE	MAX	PHI	
COEF		3380000048-				34550
STEADY		9948611048	1440941048-	1011750649	3495162953	34551
1		6421999749	1951440248	6424963949	8702499650	34552
2		6760012048-	2253336248-	7125677948	6614498152	34553
3		2704001549-	4293176749-	5073755049	5944893852	34554
4		1913843347	3792384548-	3797210648	5457780252	34555
5						
LIFT LINK	LOAD	COSINE	SINE	MAX	PHI	
COEF		5449476554				34610
STEADY		1290143253	1057414353-	1668111153	3206616153	34611
1		2266688253-	2453752853-	3340475753	1136346953	34612
2		9443866751-	2833290052-	2986536252	8385527952	34613
3		7555640052	8179231752	1113496953	1181737852	34614
4		3456831752-	7591700051-	3539212352	3847727052	34615
5						
RIGHT	CYCLIC	LOAD				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1040000053				34620
1		1813776852	1340223352	2255212852	3646117852	34621
2		7106667052	1230910953	1421333553	2999999952	34622
3		3466671051-	1040000952	1096257352	3614498752	34623
4		8839996352-	1050777653	1373167553	3251832252	34624
5		6128928051	7377796051	9606828051	1007178552	34625
LEFT	CYCLIC	LOAD				
COEF		COSINE	SINE	MAX	PHI	
STEADY		9400000051-				34630
1		1215250852-	6008768751-	1355687152	2063099553	34631
2		6580001252-	1074564453-	1260020953	1192595753	34632
3		3384000252-	7520016751	3466549352	5582372452	34633
4		5828000252-	6186885252-	8499596152	5667772952	34634
5		8725111750	1352877052	1355687652	1726198752	34635
COLLECTIVE	LOAD	COSINE	SINE	MAX	PHI	
COEF		3968000052				34640
STEADY		2096345251	7823653751-	8099643251	2850000353	34641
1		2314667052-	1718194552-	2882685552	1082933953	34642
2		9920016751	2976000252	3136980252	2385500852	34643
3		3968000052	1145462952-	4130025352	8597447252	34644
4		7823654051	2096337751-	8099641651	6900000752	34645
5						
STABILIZER	BAR	COSINE	SINE	MAX	PHI	
COEF		8616666748-				34650
STEADY		9756601750-	3452885751	3588082151	1057783753	34651
1		3446661749	5969813349	6893340849	3000004252	34652
2		1550996250	3446705049-	1588832050	1158236853	34653
3		1723300049-	2984926749-	3446672349	6000017552	34654
4		1100388550-	7994771749	1360153950	2880001452	34655
5						

## HARMONIC ANALYSIS

R F	PYLON	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		6539166749				34310
1		5996446548-	4916595247-	6016568848	1846873053	34311
2		3638333349-	2469616049	439732564,	7291512852	34312
3		1966655248-	9833268347-	2198787048	6885501552	34313
4		6883343748	5961147548	9105805848	1022334552	34314
5		8868740047-	4916643547-	1014041148	4180061452	34315

R A	PYLON	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		1075000050				34320
1		6147116548-	3915076748	7287994748	1475070953	34321
2		8500003748-	4070319849	4158125149	5089775252	34322
3		1166666743	9999921747-	9999921747	9000022352	34323
4		5000013248	1732061348	5291518548	4776666751	34324
5		1647141348	4150601747-	1698631648	6917132252	34325

L F	PYLON	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		8000000048-				34330
1		7147119548	3049039348-	7770325548	3368963853	34331
2		1799999049	4070319549-	4450561449	1469281253	34332
3		5000018347-	4999985047-	7071070147	7499993552	34333
4		2500005548-	3464101748-	4272005348	5854560757	34334
5		6471236747-	4509620047-	7887558447	4297430952	34335

L A	PYLON	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		4219166749				34340
1		9553734748	1878871848-	9736734948	3488740053	34341
2		4702081849	1981033349-	5102358949	1685769253	34342
3		5083343347-	1525005048	1607496248	3614497852	34343
4		6354169248-	5722980548-	8551489548	5550206952	34344
5		1629601248	3403880048	3773857348	1288346452	34345

RED	PITCH LINK	COSINE	SINE	MAX	PHI	
COEF						
STEADY		1392500053-				34370
1		1008283253-	1003730553-	1422712253	2248703653	34371
2		3945415052-	5225742352	6547876252	6352633552	34372
3		9283307251	1578166753-	1580894753	9112215452	34373
4		6266252352-	4019804851	6279132652	4408237652	34374
5		3584497252	1218138152	3785826252	3753913351	34375

WHITE	PITCH LINK	COSINE	SINE	MAX	PHI	
COEF						
STEADY		1433700053-				34380
1		1042688153	9667657752	1421912353	4283624852	34381
2		6561002852	2104441352	6890241752	8891820951	34382
3		4860026751-	1069199853	1070303853	3086752752	34383
4		4617000252-	4208861751	4636144552	4369782952	34384
5		5566882552-	4336603751-	5583748052	3689087052	34385



IBM TAB NO. 13b  
MANEUVER CONDITION NO. 34 - SYMMETRICAL PULL-UP  
REVOLUTION 2

		40		DELTA PER CENT	PRESSURE RADIUS		
		PER CENT CHORD	K	D E G 11201K	R E E S 30+11201K	60+11201K	90+11201K
TIME	115						
4	0			2701930051	3333550051	3544090051	4421340051
	1			4491520051	4526610051	4316070051	2526480051
	2			1122880051	5614400050	6667100050	1754500051
17	0			1327140051	1618020051	1618020051	2199780051
	1			2308860051	2345220051	2054340051	1181700051
	2			7272000050	5272200050	4363200050	1018080051
34	0			6600000050	7920000050	7920000050	1092000051
	1			1152000051	1248000051	9960000050	7320000050
	2			4560000050	3840000050	1080000050	5040000050
63	0			2765700050	3599800050	3204700050	4785100050
	1			4697300050	5794800050	4126600050	3380300050
	2			3643700050	1624300050	1097500050	2677900050
88	0			1328700050	1359600050	1143300050	1823100050
	1			1884900050	2441100050	2966400050	2688300050
	2			1081500050	1699500050	1345000049	1514100050

		55		DELTA PER CENT	PRESSURE RADIUS		
		PER CENT CHORD	K	D E G 11201K	R E E S 30+11201K	60+11201K	90+11201K
TIME	115						
2	0			5713920051	6543360051	5529600051	6174720051
	1			5253120051	8847360051	7372800051	5483520051
	2			4193280051	1751040051	1474560051	4423680051
9	0			3317850051	3908700051	3499650051	4045050051
	1			3681450051	5226750051	4045050051	3045150051
	2			2499750051	1045350051	7272000050	2499750051
17	0			2456300051	2947560051	2737020051	3158100051
	1			2982650051	3894990051	3017740051	2315940051
	2			1894860051	1087790051	5965300050	1894860051
23	0			1920240051	2275840051	2062480051	2275840051
	1			2275840051	3022600051	2346960051	1778000051
	2			1457960051	1066800051	5334000050	1457960051
34	0			1729200051	2019600051	1861200051	2125200051
	1			2164800051	2508000051	2006400051	1570800051
	2			1320000051	1122000051	5412000050	1399200051
63	0			5291000050	6308500050	5779400050	6796900050
	1			7081800050	7814400050	6105000050	4965400050
	2			4151400050	8302800050	2442000049	4517700050
90	0			1922400050	2269500050	1975800050	2616600050
	1			2990400050	3097200050	2296200050	2002500050
	2			2296200050	4485600050	8010000049	1869000050

		75		DELTA PER CENT	PRESSURE RADIUS		
		PER CENT CHORD	K	D E G 11201K	R E E S 30+11201K	60+11201K	90+11201K
TIME	115						
2	0			1028306052	8349090051	6273610051	5377380051
	1			7641540051	8160410051	7971730051	6886820051
	2			8443430051	7075500051	4764170051	8820790051
9	0			6609720051	7880820051	4999660051	4575960051
	1			7584230051	7880820051	4999660051	4194630051
	2			4491220051	3728560051	2796420051	4787810051
17	0			3892170051	3693300051	2698950051	2386440051
	1			5085390051	3409200051	3181920051	2642130051
	2			2841000051	2272800051	1761420051	2983050051
23	0			3679220051	3756950051	3109200051	2979650051
	1			3834680051	3705130051	3161020051	2591000051
	2			2668730051	1995070051	1658240051	2901920051
34	0			2244390051	2215980051	1647780051	1647780051
	1			2187570051	2272800051	1960290051	1590960051
	2			1704600051	1250040051	8238900050	1818240051
63	0			9422700050	8397100050	6666400050	7435600050
	1			8076600050	9550900050	8333000050	7884300050
	2			8012500050	8268900050	3076800050	7884300050
90	0			5751000050	3656500050	3621000050	4118000050
	1			4473000050	4899000050	4295500050	3834000050
	2			3763000050	5467000050	2449500050	3621000050

TIME	Cord. 34		85		DELTA	PRESSURE	
	PER CENT				PER CENT	RADIUS	
	CHORD	K	(120)K	D E G	30+(120)K	R E E S	90+(120)K
		115				60+(120)K	
2		0	1145262052	9128900051		6307240051	5394350051
		1	6639200051	7801060051		8630960051	8133020051
		2	9626840051	9626840051		6473220051	1070571052
4		0	1164459052	9511230051		6488970051	5155620051
		1	6844530051	8088990051		8622330051	6844530051
		2	8800110051	7911210051		5422290051	1057791052
9		0	1041048052	7739370051		4862790051	4657320051
		1	5136750051	6438060051		5547690051	4725810051
		2	5136750051	4520340051		3287520051	6438060051
13		0	6898700051	6806100051		4583700051	4491100051
		1	5046700051	5880100051		4213300051	3518800051
		2	4028100051	3241000051		2268700051	4768900051
17		0	4509840051	6176520051		4803960051	4313760051
		1	5294160051	5882400051		4117680051	3235320051
		2	3333360051	2352960051		1470600051	4117680051
23		0	3640380051	4210560051		5701800051	5460570051
		1	6315840051	3947400051		3245640051	2785110051
		2	3026340051	2127210051		1491240051	3486870051
34		0	2348800051	2146950051		1688200051	2954350051
		1	2403850051	2110250051		2091900051	1908400051
		2	2055200051	1339550051		1174400051	2348800051
47.7		0					
		1					
		2					
63		0	8092000050	7425600050		2856000050	5236000050
		1	3998400050	6378400050		7140000050	7520800050
		2	9044000050	8472800050		8853600050	1028160051
77		0	3792000050	1990800050		8532000049	5688000049
		1		1801200050		2749200050	3507600050
		2	5119200050	7204800050		6730800050	5877600050
90		0	1603100050	6601000049		2546100050	2734700050
		1	2168900050	1131600050		9430000048	3772000049
		2	1697400050	4997900050		3960600050	2546100050

Cond. 34		90		DELTA PER CENT	PRESSURE RADIUS	
PER CENT CHORD	K	(120)K	D E G 30+(120)K	R E E S 60+(120)K	90+(120)K	
TIME	115					
2	0	1047618052	8571420051	6137560051	6137560051	
	1	6031740051	7513220051	8359780051	8253960051	
	2	1015872052	1079364052	7724860051	1047618052	
9	0	9309170051	6912750051	3686800051	3778970051	
	1	3871140051	4977180051	5345860051	4239820051	
	2	4885010051	4792640051	3502460051	8295300051	
17	0	5325300051	6745380051	4615260051	5561980051	
	1	5561980051	6745380051	4378580051	4023560051	
	2	4496920051	4260240051	2840160051	5443640051	
23	0	3725520051	5392200051	5980440051	6029460051	
	1	6078480051	5588280051	2990220051	2794140051	
	2	3137280051	2843160051	1813740051	3578460051	
34	0	2222400051	2037200051	2037200051	4074400051	
	1	2926160051	1629760051	1666800051	1592720051	
	2	2000160051	1592720051	8519200050	2074240051	
63	0	6254800050	5267200050	4938000049	1646000050	
	1	2469000050	5431800050	6090200050	6748600050	
	2	8559200050	6748600050	4279600050	8559200050	
90	0	8850000048	4779000050-	8142000050-	5929500050-	
	1	4425000050-	1593000050-	2655000049-	1770000049-	
	2	1947000050	5310000050	5221500050	2566500050	

		95		DELTA PER CENT	PRESSURE RADIUS	
PER CENT CHORD	K	(120)K	D E G 30+(120)K	R E E S 60+(120)K	90+(120)K	
TIME	115					
2	0	1028805052	7211250051	4519050051	4422900051	
	1	4326750051	5576700051	6153600051	6442050051	
	2	8461200051	9807300051	7692000051	1028805052	
9	0	8707790051	6411230051	3636220051	3636220051	
	1	3636220051	4784500051	4975880051	4688810051	
	2	5262950051	5358640051	4306050051	8803480051	
17	0	5578780051	5999820051	3999880051	3894620051	
	1	3789360051	4841960051	3368320051	2947280051	
	2	3578840051	3684100051	2947280051	4526180051	
23	0	3608500051	5618950051	4691050051	4639500051	
	1	4845700051	4897250051	2319750051	2268200051	
	2	2680600051	2680600051	2062000051	3402300051	
34	0					
	1					
	2					
63	0	5452200050	3914400050	4194000049-	1258200050	
	1	2516400050	5452200050	5871600050	6570600050	
	2	8108400050	6850200050	2796000050	7269600050	
90	0	7395000049-	1261500050-	1696500050-	1261500050-	
	1	4785000049-	2610000049	8265000049	1174500050	
	2	1392000050	1044000050	1827000050	5220000049	

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	40	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		1128469952				115034100
2		2981831351-	6034239051	6730776951	1162963853	115034101
3		1723174251	5418690750-	1806364151	1712718753	115034102
4		4568340350	7744683348-	4568996750	1196762653	115034103
5		5352768850	3242045750-	6258034450	8219942552	115034104
		4254603850-	1483255350	4505740750	3215604952	115034105

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	55	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2033006452				115034200
2		3341492551-	7338433551	8063385051	1144817453	115034201
3		3253698751	6410275050	3316243551	5572695051	115034202
4		1553754051	1421536551	2105924451	1415184552	115034203
5		8491453350	1921048351-	2100351051	7346161852	115034204
		3870581750-	4271036749-	3894075150	3725937952	115034205

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	75	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2805091952				115034300
2		3746380050-	4343096351	4359224651	9493016952	115034301
3		4568843551	2779855050-	4577292551	1782591153	115034302
4		4814565051	2611617351	5477278651	9492406251	115034303
5		5360966749-	8496685050-	8513580750	6659742952	115034304
		1136776751-	1173990751-	1634171251	4518453052	115034305

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	85	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2838866252				115034400
2		2373567251	2438104851	3402671951	4576844252	115034401
3		3864368551	7274733349	3865053251	5392372650	115034402
4		3876508051	7503446750	3948459351	3651605051	115034403
5		7731456750	1587701251-	1765943351	7399104352	115034404
		1313909251-	2877820050-	1345056151	3847085052	115034405

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	90	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2971322252				115034500
2		2389388751	5285833349	2389973351	1267297251	115034501
3		2666750051	6100323350-	2735634351	1735575153	115034502
4		4511719551	1094165050-	4513046151	1195369253	115034503
5		1888629051	1941058251-	2702251551	7855391852	115034504
		1977301751-	3734251750	2012254651	3386106352	115034505

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	95	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2106741352				115034600
2		3164835751	2669731851-	4140489551	3198503353	115034601
3		3598858751	4147675050-	3622680851	1767128453	115034602
4		2856766351	1078596051	3053601651	6894816651	115034603
5		6511753350	1518923751-	1652621751	7330130552	115034604
		9264236750-	6816366749-	9289279450	3684161752	115034605

		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	15	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		7087533354				115034210
1		8589441254	6184121754-	1058403855	3242473353	115034211
2		2179741554-	2634008353	2195598654	8655488452	115034212
3		5069153353-	1013808353-	5169537953	6376989952	115034213
4		8617569753-	6146046753	1058472554	3612588952	115034214
5		5604225554	3649540554	6687786654	6614533751	115034215
RED BLADE	BEAM	BENDING	28	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1906366754				115034220
1		2149524254	2225374254-	3093985254	3140067453	115034221
2		2502537753-	2294749353	3395374653	6874007352	115034222
3		8538085053	3827474853	9356712953	8046527951	115034223
4		6918784053-	1274864353	7035257753	4238992952	115034224
5		2914442554	1548216554	3300143854	5595646551	115034225
RED BLADE	BEAM	BENDING	36	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		9287500052				115034230
1		1382238554	2587165754-	2933259254	2981141453	115034231
2		8023744553-	8508693352	8068733253	8697337852	115034232
3		1146250354	1048000454	1553124154	1414541152	115034233
4		1637528852	1418115753-	1427538853	6914672552	115034234
5		1892761054	5894158753	1982411554	3459373451	115034235
RED BLADE	BEAM	BENDING	45	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		7446000053-				115034240
1		1374682954	2836687054-	3152228854	2958552353	115034241
2		9521994753-	1195115253	9596701753	8642308152	115034242
3		1131600454	1021200354	1524260354	1402144252	115034243
4		5519994352	9560935852	1104001053	1500001752	115034244
5		6815162853	7686965051	6815596353	1292447550	115034245
		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	60	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		3644420054-				115034250
1		1579204754	2818648254-	3230892354	2992606153	115034251
2		7308595353-	1839322353	7536489453	8293698852	115034252
3		5746935553	9619863853	1120576054	1971526052	115034253
4		1686589553	5409777752-	1771225953	8555405952	115034254
5		1666659854-	9793256853-	1933089254	4208768252	115034255
RED BLADE	BEAM	BENDING	65	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4550870854-				115034260
1		1500320654	2879069054-	3246536654	2975246253	115034261
2		5508704753-	1122517852-	5509848253	9058368352	115034262
3		2073868753	1023971254	1044761454	2618354952	115034263
4		2397894253	1010263253-	2602023953	8428842452	115034264
5		2563179254-	1307550354-	2877425154	4140548452	115034265
RED BLADE	BEAM	BENDING	80	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4979570854-				115034270
1		2981644553	1899464754-	1922724154	2789210953	115034271
2		1047954054-	3340688352-	1048486354	9091293952	115034272
3		2700247853-	6686326053	7210984253	3733038052	115034273
4		5721942353	7794929352	5774792953	1939394451	115034274
5		3577041554-	1520852954-	3886929454	4060675552	115034275
RED BLADE	BEAM	BENDING	92.5	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2270416754-				115034280
1		4980701353-	7530681853-	9028762553	2365198453	115034281
2		4591665853-	1645447753-	4877590953	9985771052	115034282
3		2691666253-	3483330353	4402119653	4256475652	115034283
4		1266661353	1371205853	1866718053	1181739252	115034284
5		1512764054-	5610991353-	1613470554	4007006452	115034285

## HARMONIC ANALYSIS

WH. BLADE	BEAM BEND	15 070 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		7927958354				115034410
1		5355594854-	1004584254	645599154	1460475653	115034411
2		1499918754-	6356412853-	1628288254	1014508553	115034412
3		1060915854-	1316611753-	1288751054	7153077952	115034413
4		1829158553	2534560554-	1125670653	7645637252	115034414
5		5987237254-	3218750254-	6807092854	4168216852	115034415

WH. BLADE	BEAM BEND	2 070 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		2514010954				115034420
1		1522700054-	2270898554	2734153554	1238629453	115034421
2		4855090353-	7207950052	4908303553	8577773052	115034422
3		8045566053-	1081990254-	1348337554	778863052	115034423
4		4161463352	3123431853-	3151054253	6939725652	115034424
5		2916232754-	1188908554-	3145272454	4043601252	115034425

		HARMONIC		ANALYSIS		
RED BLADE	CHORD	BENDING	15	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4985750055				115034110
1		3462872755	1510293455-	3777892755	3364361253	115034111
2		2470408354	1166966754	2732165554	1264251252	115034112
3		5839160254-	4534160024-	1034058455	7853988652	115034113
4		2021245254	1944941854-	2405056754	7902553752	115034114
5		1127206155-	4211225254-	1203302955	4009712452	115034115
RED BLADE	CHORD	BENDING	28	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4902037555				115034120
1		2729827055	1258876055-	3006114555	3352429353	115034121
2		2060907754	1019886754	2299458554	1316477352	115034122
3		5888326754-	7449243354-	9892565954	7782371852	115034123
4		1766495354	2549716554-	1101863954	7617875052	115034124
5		7927686754-	5959482554-	1157905055	4219518852	115034125
RED BLADE	CHORD	BENDING	60	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2521511355				115034130
1		8144254554	3909899554-	9034168254	3343552453	115034131
2		2648156754	1263019254-	2933931054	1672507653	115034132
3		2533021554-	3223847754-	4059925954	7728093252	115034133
4		1727060354	1130066254-	2063925154	8170052852	115034134
5		5150679554-	4840546754-	7068266554	4464441752	115034135
RED BLADE	CHORD	BENDING	80	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1705018855				115034140
1		2658180554	1531449754-	3067778054	3300525953	115034141
2		1332654854	8146701753-	1561939954	1642809953	115034142
3		4623061753-	1254265254-	1522088454	7849717252	115034143
4		7055246753	2715548353-	7559808853	8473710152	115034144
5		2501395854-	2074564254-	3249738154	4393420952	115034145
WH. BLADE	CHORD BEND	15 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		4537610055				115034430
1		3880774755-	1897142855	4319671655	1539480053	115034431
2		2551261554	2525096854-	3589575054	1576476653	115034432
3		6924870254	1093400155	1294241955	1921751552	115034433
4		1093412454	1333333348	1093412454	1746696246	115034434
5		1548189955	5083380354	1629509055	3635451451	115034435
WH. BLADE	CHORD BEND	28 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		4559050055				115034440
1		2753102555-	1441823255	3107801155	1523585753	115034441
2		2759419754	1870223854-	3333486854	1629360853	115034442
3		4559053854	8398252354	9555720454	2050144852	115034443
4		1559685254	1039012354-	1874077054	8158243052	115034444
5		1361394155	6937328554	1527959255	5400454051	115034445
		HARMONIC		ANALYSIS		
RED BLADE	TORSION	15 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		4015570054-				115034350
1		3189887253-	1780672054-	1809018154	2598437953	115034351
2		1132595654-	1426701854	1821606754	6422226152	115034352
3		1132596954-	7207434753-	1342477954	7082373252	115034353
4		8333333346	8916883753	8916883753	2249999852	115034354
5		2160242553	1756323253-	2784119153	6417763352	115034355
RED BLADE	TORSION	50 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1483560054-				115034360
1		3417829853-	9105622353-	9725940553	2494261953	115034361
2		3550397853-	1666666746-	3550397953	9000000552	115034362
3		4945200053-	2155600253-	5394591353	6785075752	115034363
4		1141199653	2415863353	2671840653	1617875052	115034364
5		7550245052	1418781253-	1607172153	5960406152	115034365



## HARMONIC ANALYSIS

RED BLADE COEF STEADY	PITCH	POSITION COSINE	SINE	MAX	PHI	
1		1711907952				115034510
2		1238488351	3787773751-	3985107751	2881062053	115034511
3		1455851750	2521650050-	2911738850	1499998053	115034512
4		4270588350	1747070050	4614128150	7416384151	115034513
5		6794116749	5447608350-	5589057050	6924555452	115034514
		4426081750-	5573366749-	4461033850	3743539452	115034515
RED BLADE COEF STEADY	FLAP	POSITION COSINE	SINE	MAX	PHI	
1		2482666750-				115034520
2		3937811351-	1364785850	3940175651	1780150153	115034521
3		1861999750	1996479350	2730013350	2349805952	115034522
4		3014667250-	1773358349-	3019878550	6112217052	115034523
5		6206693349	1382175750	1515137050	1645435652	115034524
		2827217350-	4781210049-	2867360750	3791973752	115034525
VERTICAL COEF STEADY	ACCL	COSINE	SINE	MAX	PHI	
1		1245630051				115034530
2		1839620049	2706000549-	3272100249	3042090453	115034531
3		5379521749-	8790166748	5450864449	8535992952	115034532
4		1217985049-	4262986749-	4433570149	8468491652	115034533
5		1725492249-	2285451749	2863671249	3176310752	115034534
		6216000048-	9479788348-	1133600649	4734934352	115034535
FORE-AFT COEF STEADY	ACCEL	COSINE	SINE	MAX	PHI	
1		1531316750-				115034540
2		2151145349-	2183558349	3065184049	1345715853	115034541
3		2809253349	5629021049	6291087449	3173888652	115034542
4		5508303348	1872830849	1952155049	2453684252	115034543
5		5673585249-	6964722049-	8983146649	5770828752	115034544
		5219716749-	1632725749-	1633559649	5363383352	115034545
LATERAL COEF STEADY	ACCEL	COSINE	SINE	MAX	PHI	
1		9576666748-				115034550
2		3229052248-	2816659248-	4284897548	2210977653	115034551
3		1121033350	4878613248-	1122094450	1787540653	115034552
4		7886644748	4506661748	9083455648	9914974651	115034553
5		4450135749-	6732481549-	8070427249	5913358252	115034554
		1277618248-	2816667848-	3092883148	4912026752	115034555
LIFT LINK COEF STEADY	LOAD	COSINE	SINE	MAX	PHI	
1		6648928054				115034610
2		9722393352	1048149753-	1429638853	3128487953	115034611
3		3494475253-	1799416753-	3930554453	1036227053	115034612
4		1888821752-	1888893253-	1898313553	8809654252	115034613
5		3777836752	6666666747	3777836752	2527715647	115034614
		5000021752-	5574031752-	7487993552	4562144752	115034615
RIGHT COEF STEADY	CYCLIC	LOAD COSINE	SINE	MAX	PHI	
1		1196000053				115034620
2		1940666052	7737785351	2089238552	2173806452	115034621
3		1092000053	1110822153	1557687353	2274477752	115034622
4		1040000552-	1386668652	1733335252	4228996052	115034623
5		8839993052-	2191621753	2363188653	2799172252	115034624
		1393375851	4271104751-	4492641951	5761361152	115034625
LEFT COEF STEADY	CYCLIC	LOAD COSINE	SINE	MAX	PHI	
1		3948000052-				115034630
2		3407378852-	3625037851-	3426607552	1860727453	115034631
3		2086799853-	1850065753-	2792796753	1108254653	115034632
4		2256000252-	1880004752	2936657052	4673145452	115034633
5		1071599353-	6186885852	1237376553	3749999652	115034634
		1151382552	2242500552	2520811452	1256447352	115034635
COLLECTIVE COEF STEADY	LOAD	COSINE	SINE	MAX	PHI	
1		3968000052				115034640
2		7380665051	3749663351-	8278538051	3330676753	115034641
3		6778662752	5440950252-	8692192352	1606237253	115034642
4		6613348351	2645331752	2726746052	2532124052	115034643
5		5455994752	1174099653-	1294677153	7373102952	115034644
		4074021751-	9476970051-	1031555252	4934755752	115034645
STABILIZER COEF STEADY	BAR	COSINE	SINE	MAX	PHI	
1		8616666748				115034650
2		1744521251-	9475018550	1985223951	1514922953	115034651
3		1378667250-	5969791749-	1502367250	1017065953	115034652
4		1033999250	1723316749	1048261750	3154080051	115034653
5		3446645049-	8333333343-	3446645049	4500003652	115034654
		1327840049-	5203148549	5369908149	2086325652	115034655

		HARMONIC		ANALYSIS		
R F	PYLON	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		7866666749				115034310
1		3915692348-	5107151248-	6595340948	2335795753	115034311
2		4056249844-	4385647244-	5973901744-	6638258752	115034312
3		1475011748	4424992348-	4664356048	7614504052	115034313
4		4670844348	2128986348-	5133163648	8125914151	115034314
5		5092916047-	2357165048	2411556548	2043839652	115034315
R A	PYLON	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		6250000049				115034320
1		2598081548-	1339818747	2601533948	1770479053	115034321
2		5000029047	5975575547	5975784749	4476029752	115034322
3		1499993148-	2499999048-	2915471548	7967878352	115034323
4		6500005548	8660296747	6557444548	1697280151	115034324
5		2598092748	1866030343	3198774048	7137415051	115034325
L F	PYLON	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		2475000049				115034330
1		781097548	2915067048	6474465548	2675912052	115034331
2		2449997849	5975575749-	6458327549	1461468753	115034332
3		2000001048	1500005048	2500003848	1228999252	115034333
4		3000003548-	3464099248-	4582576148	5727663952	115034334
5		2810950047-	1415061848-	1442710748	5175294752	115034335
L A	PYLON	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1880833349				115034340
1		4792677748	7520403048	8917747548	5749104452	115034341
2		4651248349	2685400749-	5370799649	1650300053	115034342
3		1016668948-	4066666748	4191824748	3467876052	115034343
4		1042083949-	1081605648-	1086693149	4911844552	115034344
5		2251010248-	4037280047-	2286928448	3803362652	115034345
RED	PITCH LINK	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		2042333353-				115034370
1		1399492853-	1631575553-	2149562453	2293784853	115034371
2		1438915953-	1366732653	1984549653	6823689052	115034372
3		1578167053-	2227999753-	2730310253	7822959552	115034373
4		1021166153-	1286336453	1642389053	3211113152	115034374
5		6104090752	3783249252	7181427352	6351037151	115034375
WHITE	PITCH LINK	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1968300053-				115034380
1		1470087853	1690531753	2240324953	4898975452	115034381
2		2915996252-	5050662252	5831999952	5999998052	115034382
3		1603799653	1069149753	1927527253	1123002352	115034383
4		8747998852-	1178487253	1467687653	3164669652	115034384
5		8868873852-	3297320252-	9461989452	4007888452	115034385

IBM TAB NO. 13c  
MANEUVER CONDITION NO. 34 - SYMMETRICAL PULL-UP  
REVOLUTION 3

TIME	PER CENT CHORD	F	DELTA PER CENT				PRESSURE RADIUS			
			U E U				R E E S			
			11201K	30+11201K	60+11201K	90+11201K	11201K	30+11201K	60+11201K	90+11201K
211	4	0	5263370051	5754630051	5824810051	4666770051				
		1	4070440051	4245890051	4421340051	2526480051				
		2	4912600050	6316200050	6667100050	1579050051				
17	1	0	1581660051	1763460051	1763460051	2236140051				
		1	2054340051	2236140051	2181600051	1236240051				
		2	5090400050	6361000050	5817800050	9453600050				
34	0	0	8400000050	8880000050	8400000050	1104000051				
		1	1032000051	1152000051	1068000051	1092000051				
		2	5760000050	3840000050	1200000050	4320000050				
63	0	0	3027100050	3775400050	3599800050	4258300050				
		1	5653400050	5443600050	4477800050	2985200050				
		2	5487500050	2107200050	5707000049	2677900050				
90	0	0	1359600050	1421400050	1359600050	1452300050				
		1	1722200050	2193900050	2410200050	2657400050				
		2	1390400050	2842800050	6484000047	1514100050				

TIME	PER CENT CHORD	K	DELTA PER CENT				PRESSURE RADIUS			
			U E U				R E E S			
			11201K	30+11201K	60+11201K	90+11201K	11201K	30+11201K	60+11201K	90+11201K
211	2	0	6497280051	7096320051	6312960051	6635520051				
		1	5852160051	8248320051	7741440051	5345280051				
		2	4331520051	2119680051	2119680051	4469760051				
9	0	0	3681450051	4090500051	3954150051	4317750051				
		1	3772350051	4817700051	4272300051	3181500051				
		2	2408850051	1090800051	1136250051	2499750051				
17	0	0	2666840051	3123010051	3017740051	3368640051				
		1	2982650051	3614270051	3123010051	2351030051				
		2	1754500051	1157970051	4123400050	1894860051				
23	0	0	1991360051	2366960051	2240280051	2489200051				
		1	2240280051	2773680051	2418080051	1778000051				
		2	1386840051	1066800051	6178600050	1457960051				
34	0	0	1795200051	2112000051	2072400051	2257200051				
		1	2072400051	2389200051	2085600051	1597200051				
		2	1386000051	1069200051	8712000050	1372800051				
63	0	0	5473800050	6349200050	6227100050	7041100050				
		1	6959700050	7436500050	6715500050	5087500050				
		2	4884000050	4802600050	2523400050	4273500050				
90	0	0	2322900050	3017100050	2456400050	2589900050				
		1	2773400050	3150600050	2696700050	2403000050				
		2	2723400050	4619100050	1628700050	1975800050				

TIME	PER CENT CHORD	F	DELTA PER CENT				PRESSURE RADIUS			
			U E U				R E E S			
			11201K	30+11201K	60+11201K	90+11201K	11201K	30+11201K	60+11201K	90+11201K
211	2	0	1009438052	7471740051	6226440051	6698140051				
		1	6839650051	7664180051	7424560051	7452860051				
		2	8679280051	6886820051	3443410051	9622680051				
9	0	0	5847060051	5550470051	5465730051	6143650051				
		1	6143650051	4799660051	4799660051	4575960051				
		2	4406480051	3643820051	1694800051	5042030051				
17	0	0	3579660051	3352380051	2812590051	3409200051				
		1	3039870051	2954640051	3210330051	2841000051				
		2	2869410051	2187570051	8523000050	3181920051				
23	0	0	3290570051	3497850051	3161020051	3471940051				
		1	3083240051	3290570051	3238750051	2746460051				
		2	2668730051	1917340051	9068500050	4057380051				
34	0	0	1960290051	2073930051	1818240051	1931880051				
		1	1761420051	1988700051	1460290051	1676190051				
		2	1590960051	1221670051	2272800050	1931880051				
63	0	0	9166300050	7820200050	6602300050	8333000050				
		1	7435600050	8904900050	9018100050	8268900050				
		2	7820200050	7756100050	1282000050	8909900050				
90	0	0	5431900050	4337000050	3514500049	4153700050				
		1	4153500050	4792500050	4417500050	4011500050				
		2	4153500050	5360500050	1365000050	4011500050				

TIME	PER CENT CHORD	R	DELTA PER CENT		PRESSURE RADIUS	
			D E C		R E E S	
			1201K	30*1201K	60*1201K	90*1201K
		211				
	0		1120365052	8713940051	6307240051	5892290051
	1		5560330051	6473270051	8464980051	9045910051
	2		9792820051	9626840051	5560330051	1087169052
	0		1102236052	8977890051	6400080051	5955630051
	1		5511180051	6488970051	8444550051	8000100051
	2		9066780051	8711270051	4622280051	1040013052
	0		6643530051	7259940051	4999770051	4657320051
	1		4246380051	5068260051	5347220051	5273730051
	2		7136750051	4588810051	2671110051	6985980051
	0		4305900051	5926400051	4722600051	4583700051
	1		4259600051	4954100051	4167000051	3935500051
	2		5981800051	3518800051	1666800051	4907800051
	0		4137280051	4607880051	4907000051	4705720051
	1		6411800051	3627480051	3921600051	3431400051
	2		3235320051	2647040051	7843200050	3921600051
	0		7828970051	3443010051	6030750051	5899170051
	1		5350920051	2960550051	3267570051	3004410051
	2		3004410051	2434230051	1162290051	3552660051
	0		2110250051	1945100051	1981800051	2128600051
	1		1504700051	1981800051	2183650051	2073550051
	2		7073550051	1468000051	7707000050	2330450051
	0					
	1					
	2					
	0		1199440051	6473600050	4188800050	4760000050
	1		2380000050	6092800050	7806400050	8092000050
	2		8758400050	7616000050	5997600050	1047200051
	0		9195600050	1422000050	2844000049	2844000049
	1		9480000049	1611600050	3128400050	3886800050
	2		4740000050	6162000050	4929600050	6446400050
	0		4620700050	8487000049	2168900050	2074600050
	1		2734700050	1131600050	1886000049	6601000049
	2		1791700050	4054900050	2734700050	3489100050

TIME	PER CENT CHORD	K	90		DELTA PER CENT	PRESSURE RADIUS	
			(120)K		U F G	R E E S	90+(120)K
			(120)K	30+(120)K	60+(120)K	90+(120)K	
211							
2		0	1058200052	7936500051	6243380051	6031740051	
		1	4913540051	6137560051	8148140051	9206340051	
		2	1037046052	1058200052	7195760051	1037036052	
9		0	7004420051	6267560051	4055480051	3686800051	
		1	3133780051	4055480051	5345860051	4792840051	
		2	4977180051	4792840051	3133780051	8848320051	
17		0	4260240051	6151680051	4970280051	4733600051	
		1	4141400051	4733600051	4378480051	4496920051	
		2	4496920051	4141900051	2366800051	5325300051	
23		0	2774140051	4656900051	6225540051	5980440051	
		1	5441220051	3137280051	3068260051	3039240051	
		2	3137280051	2892180051	1617660051	3676500051	
34		0	1185780051	1777920051	2666880051	2815040051	
		1	1296400051	1170480051	1666800051	1740880051	
		2	1963120051	1740880051	7408000050	2481680051	
63		0	6748600050	4608800050	2304400050	2469000050	
		1	1646000050	5102600050	6748600050	7407000050	
		2	8559200050	6913200050	7906000050	8394600050	
90		0	4513500050	4867500050	6283500050	6372000050	
		1	4779000050	2217500050	4475000049	1504500050	
		2	1770000050	4748900050	4602000050	4071000050	

TIME	PER CENT CHORD	K	95		DELTA PER CENT	PRESSURE RADIUS	
			(120)K		U F G	R E E S	90+(120)K
			(120)K	30+(120)K	60+(120)K	90+(120)K	
211							
2		0	9999600051	6730500051	4711350051	4230600051	
		1	3365250051	4230600051	6249750051	7018950051	
		2	8461200051	9615000051	7115100051	1028805052	
9		0	8133650051	6124160051	3923290051	3349150051	
		1	2775010051	3731910051	5167260051	5167260051	
		2	5262450051	5358640051	3923290051	6994860051	
17		0	3999880051	5894560051	4210400051	3578840051	
		1	3052540051	3578840051	3473580051	3263060051	
		2	3578340051	3789360051	2526240051	4315660051	
23		0	2835250051	4433300051	4742600051	4639500051	
		1	4175500051	2783700051	2474400051	2577500051	
		2	2629050051	2732150051	1752700051	3402300051	
34		0					
		1					
		2					
63		0	2796000050	3075600050	1677600050	1398000050	
		1	1957200050	4613400050	6650200050	7129800050	
		2	7828800050	7409400050	3495000050	7269600050	
90		0	4350000048	1392000050	1607500050	1131000050	
		1	6575000049	4350000049	1000500050	1131000050	
		2	1392000050	4135000049	1392000050	7830000049	

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	40	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		1159752252				211034100
2		2456112051	5801593851	6300077551	1129454453	211034101
3		2063897051	4750369250	2117860051	6480872951	211034102
4		3238638550	7720981749	3329401650	4469711451	211034103
5		1104241851	1471131250	1114957951	8801858052	211034104
		1264413350	4202276749	1332416050	3232315652	211034105

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	55	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2119170052				211034200
2		2400945051	7509340251	7083826951	1077305353	211034201
3		3140046351	9921293350	3293050351	8767242151	211034202
4		5663596750	8205443350	9970237150	1846187352	211034203
5		7718860050	1226334551	1449035651	7554684152	211034204
		1871628350	7107523350	7349821850	2095056452	211034205

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	75	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2659951752				211034300
2		4884040050	4407310851	4434289851	9632354052	211034301
3		3871007351	2064619351	4387180351	1403671752	211034302
4		4026871551	9079138350	4127953751	1157647853	211034303
5		2047704251	2846873251	3506819151	7643170052	211034304
		1864946851	1511989251	2404747751	4779161752	211034305

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	85	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2674563552				211034400
2		1987125251	1092247551	2267525351	2879593152	211034401
3		3212512551	2464640851	4052081351	1877576452	211034402
4		2578895551	1391574351	2930189251	1105495553	211034403
5		1622659251	2870029351	3296982151	7487074552	211034404
		1702617251	1552105351	2303895451	4447045952	211034405

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	90	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2795821152				211034500
2		2760761351	2796770251	3929864851	3146289853	211034501
3		2487714351	2156534851	3292319151	2046058452	211034502
4		1112662751	2042279351	2325709151	9952739452	211034503
5		9553155050	3246029751	3431681851	7154040352	211034504
		2335875251	1135254851	2597136251	4118402952	211034505

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	95	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2002108052				211034600
2		2826937351	3626465251	4598132851	3079374853	211034601
3		2903758251	1264461551	3167124951	1176554152	211034602
4		1266411751	3198781350	1706185651	1152747953	211034603
5		7373400050	1690127051	1843968051	7339251952	211034604
		1750637551	1026432551	2029358451	4207678452	211034605

		HARMONIC		ANALYSIS	
RED BLADE	BEAM	BENDING	15	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		6732691754			211034210
1		7153827754	6786117754-	9860458654	3165110153
2		1520750854-	3336421354-	3666659254	1227481853
3		3041488353-	1013830754-	1058470254	8443359452
4		1419365354-	1051607554	1767678354	3585329452
5		5924621354	1918336354	6197377354	3412373851
211034211					
211034212					
211034213					
211034214					
211034215					
RED BLADE	BEAM	BENDING	20	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		19652500-4			211034220
1		1859335554	2547685054-	3154017754	3061224853
2		4857874753-	3314641853-	5880569153	1071533253
3		8832505053	2944177353	9310779353	6144993051
4		4416198552-	2294748753-	2336856853	6477668452
5		3440164054	1040276053	3441736554	3464094750
211034221					
211034222					
211034223					
211034224					
211034225					
RED BLADE	BEAM	BENDING	36	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		2018750053-			211034230
1		1239566254	2641854054-	2918204454	2951361253
2		6549995553-	2268985753	6931863953	8044669652
3		1113500354	5567503553	1244931354	8855019851
4		3274974552-	1701739253-	1732965953	6477667252
5		2657683054	2511043853	2669519154	1079484551
211034231					
211034232					
211034233					
211034234					
211034235					
RED BLADE	BEAM	BENDING	45	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		1044400054-			211034240
1		1361378354	2956331254-	3254726654	2947258853
2		8900997053-	3585341752	8908215053	8884668152
3		1062600454	4554001753	1156074854	7732863651
4		3449961052	2987786353-	3007638553	6914667952
5		7638206553	2314686353-	7981226253	6862821552
211034241					
211034242					
211034243					
211034244					
211034245					
		HARMONIC		ANALYSIS	
RED BLADE	BEAM	BENDING	60	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		3694393354-			211034250
1		1364575554	2874299754-	3181770754	2953960653
2		7870796753-	4327820052-	7882686253	9157364552
3		6496535053	6621463553	9276246353	1518187952
4		2373719853	3029472353-	3848668353	7702005352
5		2314070754-	6238344353-	2396683754	3901746452
211034251					
211034252					
211034253					
211034254					
211034255					
RED BLADE	BEAM	BENDING	65	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		4460139254-			211034260
1		1158788654	3100314554-	3309794754	2904939853
2		9073162853-	8980106352-	9117444553	9282620552
3		5573518353	8813929053	1042830054	1923088252
4		3629250353	2245026353-	4267505253	8206484952
5		3465967354-	4511832353-	3495210354	3748335952
211034261					
211034262					
211034263					
211034264					
211034265					
RED BLADE	BEAM	BENDING	80	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		5230308354-			211034270
1		2392547753	2148908054-	2162186054	2763530353
2		1035095454-	2783911053-	1071878854	9752680352
3		1671583853	9643743853	9787542453	2672214352
4		5721943353	1224919253	5851586353	3020789551
5		4148189854-	5899182853-	4189926454	3761876552
211034271					
211034272					
211034273					
211034274					
211034275					
RED BLADE	BEAM	BENDING	92.5	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		2579166754-			211034280
1		3489426353-	8832566853-	9496859153	2484428353
2		7283330753-	1371206353-	7411282853	9533103952
3		1108333753	5541663551	5651410353	2623002052
4		316660153	1371206053	3450788853	5853313451
5		1994391554-	2250774753-	2007051954	3728777752
211034281					
211034282					
211034283					
211034284					
211034285					



## HARMONIC ANALYSIS

WH. BLADE	BEAM BEND	15 0/0 R					
COEF		COSINE	SINE	MAX	PHI		
STEADY		7153500054					211034410
1		4076509254-	1528066251	4079372154	1778531053		211034411
2		1646252554-	3485030754-	3854294054	1223574953		211034412
3		6584988353-	4390005753	7914178153	4816995252		211034413
4		7682508353-	3166720051	8310147553	3939726252		211034414
5		7117990054-	2128106554-	7429365554	3932937552		211034415

WH. BLADE	BEAM BEND	2 0/0 R					
COEF		COSINE	SINE	MAX	PHI		
STEADY		2805315054					211034420
1		1260401054-	1417826754	1897061854	1316360453		211034421
2		5658408751-	6727399253-	9465321253	1126476553		211034422
3		5826097353-	4438933553-	7324448253	7243465452		211034423
4		3329194851	1922111053-	3844222851	8250000552		211034424
5		3566938354-	6965002253-	3634303554	3820977452		211034425

		HARMONIC		ANALYSIS		
REF	BLADE	CHORD	BENDING	15	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI	
STEADY		4424291755				211034110
1		2980824855	7050184254	3063065055	3468930653	211034111
2		2245756753	1889908353	4491637853	1499995453	211034112
3		5839161354	5389994054	1946561554	7423646352	211034113
4		1577078854	3500901854	3837674454	7354561452	211034114
5		1453658055	2382310254	1473049855	3786142452	211034115

RED	BLADE	CHORD	BENDING	28	PER	CENT	RADIUS
COEF		COSINE	SINE		MAX	PHI	
STEADY		4592900055					211034120
1		2362863355	4739539754	2409928555	3486578753		211034121
2		1177658754	1529836854	1930616654	1537944353		211034122
3		6771578054	4616244354	4084397554	7103711352		211034123
4		8832468353	4679541554	4174070654	7055408152		211034124
5		1157754655	3209706754	1199496155	4910415852		211034125

RED	BLADE	CHORD	BENDING	60	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI	
STEADY		2467780455				211034130
1		7249571554	2337661753	7253739354	3581532153	211034131
2		3837911554	8333333354	3837911554	1800000053	211034132
3		4147089354	3684398054	4443509354	7049905752	211034133
4		5371065053	4653224254	4684142754	6214669052	211034134
5		2721228054	2759804354	3875771154	4506065152	211034135

RED	BLADE	CHORD	BENDING	80	PER CENT	RADIUS
COEFF			COSINE	SINE	MAX	PHI
STEADY			1673662155			211034140
1			1982103254	3713350052	1982451054	3589267353
2			1998984354	2036671753	2009332854	2908762751
3			7055233353	1567832254	1719261854	6192409652
4			1919650052	2647676254	2647966354	6728796352
5			1276576354	1510696554	1993158054	4603448852

WH. BLADE	CHORD BEND	15 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		5047863355				211034430
1		3224735055	1297081355	3475821655	1580585953	211034431
2		2186795854	3787650454	4373549854	3009003052	211034432
3		5831471054	6924867254	4053168754	1663302852	211034433
4		1457879354	1262547754	1926584754	1917672552	211034434
5		2204229755	1607864454	2210086255	8344046350	211034435

WH. BLADE	CHORD BEND	28 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		5062945055				211034440
1		2383533555	1292285255	7711315755	1515346953	211034441
2		1679654854	2909240254	3359303654	6000003252	211034442
3		5998754754	1199752954	6117553854	3769983751	211034443
4		6958560254	4156031753	6970960254	8914551352	211034444
5		1855645055	6273157354	1958811855	4735648951	211034445

		HARMONIC		ANALYSIS		
RED BLADE	TORSION	15 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		4375941754-				211034350
1		1406509853-	2288096354-	2292415254	2664824153	211034351
2		6177790053-	6666666746-	6177790053	9000000552	211034352
3		2059269353-	3088900753	3712397953	4123003452	211034353
4		1029630853-	1605039354	1608338554	2341762452	211034354
5		3768675052	7436450753	7445994153	1741976452	211034355

RED BLADE	TORSION	50 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1356760054				211034360
1		2073493853	1047766754	1068095854	2588033753	211034361
2		5705974052	2964924553	3019330853	1295533353	211034362
3		8875999252	2156005553	2331190153	3746004452	211034363
4		2726201053	6478508353	7029112753	1679489352	211034364
5		1439989753	1601658753	2153806153	9608501251	211034365

		HARMONIC		ANALYSIS		
RED BLADE	PITCH	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1693466852				211034510
1		1624120751	6158360751	6168922651	2847740153	211034511
2		1747025050	2017318350	2668645650	1554465153	211034512
3		4464706350	5823266747	4502524250	1175229853	211034513
4		1941173050	3698396750	4176874350	7442338552	211034514
5		9059750049	7278166747	1162113550	4375534452	211034515
RED BLADE	FLAP	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		7980000049				211034520
1		1250435551	6358535550	1402871651	2063524953	211034521
2		2127999550	2150053250	3025080350	6735232452	211034522
3		1595998550	3901332850	4215164250	3741633752	211034523
4		4166666743	9214512349	9214512349	2249999352	211034524
5		4519046050	1444132350	4744185350	3754442052	211034525
VERTICAL	ACCEL	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1299425051				211034530
1		1964673349	6324540747	6622669449	7872570453	211034531
2		6597303348	1318523349	1474363549	1482906753	211034532
3		5074666748	1978485047	1994140749	6508556852	211034533
4		4212739849	2724960047	5016806849	3677514552	211034534
5		8481516748	1714485047	8651048148	4828546852	211034535
FORE-AFT	ACCEL	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		9143833349				211034540
1		3708228348	8626198348	9389475748	2932619053	211034541
2		9915030048	7533614049	7621740149	1992082052	211034542
3		1211815549	7711675048	1436399949	7082372652	211034543
4		7067667349	3434657549	6171937949	5353195452	211034544
5		1800091748	9145223347	2019079348	5386497251	211034545
LATURAL	ACCEL	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		5633333347				211034550
1		1276528049	7193883248	1573149347	2157624153	211034551
2		1109766750	2244160349	1132230050	5716067951	211034552
3		5633332848	4506661748	7214167548	1288662752	211034553
4		2107668349	5951904049	6384334749	6219774952	211034554
5		3008051748	1032054449	1074997749	1249887552	211034555
LIFT LINK	LOAD	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		6186147554				211034610
1		2542325553	2961447751	3903023353	3106452353	211034611
2		1652776853	6297965651	6511224553	1423522953	211034612
3		1888833352	7575528352	7780048552	5552136952	211034613
4		3919463853	1861217253	4347546053	3859012252	211034614
5		1220085853	3441155052	1267684953	5415013852	211034615
RIGHT	CYCLIC	LOAD				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1571333353				211034620
1		1327776352	1259778652	1810309352	4349468652	211034621
2		1005332553	6004443752	1170944553	7457592952	211034622
3		1386669552	3120002252	3414273952	2201244452	211034623
4		3466671552	6604888552	7459380952	1557665352	211034624
5		1674438352	1860221352	2702831852	2839825752	211034625
LEFT	CYCLIC	LOAD				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1692000052				211034630
1		2407125052	1591751052	1885539352	2134670853	211034631
2		2725999851	8140637352	1844956053	7831354852	211034632
3		1127997852	3007995752	3212540652	8514799152	211034633
4		1692000052	1269931853	1281162053	2060272052	211034634
5		4360871752	2887535751	4170421152	3675766052	211034635
COLLECTIVE	LOAD	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1818666752				211034640
1		1665204752	2996554652	3428159452	2990611753	211034641
2		7109331552	4868218052	6616388352	1627970253	211034642
3		6613323351	7919991751	1192234452	4123001952	211034643
4		9093329552	1116826453	1440204053	7728822052	211034644
5		3956126252	1012560852	4083652052	2871307351	211034645
STABILIZER	RAK	POSITION				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1242700053				211034650
1		2172860851	465487051	128543751	2449326253	211034651
2		1723330452	8754711452	1110100452	7944668552	211034652
3		1723338250	1206330250	103598650	1083360453	211034653
4		1550997050	8954739847	1790939850	7556038251	211034654
5		3594658249	1303536950	1752192350	1491667452	211034655

HARMONIC ANALYSIS

COEF	R F	PYLON	POSITION	COSINE	SINE	MAX	PHI	
STEADY				393333349				211034310
1				1229160548	4947234048-	5097642648	2839528653	211034311
2				3712082749-	2852832349	4681688849	7122639552	211034312
3				2458325748-	4916725047	2507011648	5622997052	211034313
4				4179177048	5535349748	6935821248	1323681952	211034314
5				1229181548	1013904248	1593389148	7903580451	211034315

COEF	R A	PYLON	POSITION	COSINE	SINE	MAX	PHI	
STEADY				1287500050				211034320
1				7080135348-	3349515047	7088054048	1772914453	211034321
2				1074999949-	6105479349	6199395349	4999290052	211034322
3				4000013348	3500010048	5315089548	1372863852	211034323
4				5749986848-	3031100848	6499993848	3805102152	211034324
5				1580163248	4665071248	4925424348	1425752352	211034325

COEF	L F	PYLON	POSITION	COSINE	SINE	MAX	PHI	
STEADY				1375000049-				211034330
1				5397122348	1160260047	5398369348	1231540851	211034331
2				2774998349	5585864349-	6237186549	1482088553	211034332
3				3450000042-	1499999748-	1499999748	8999795952	211034333
4				8750009348-	5629165548-	1040433449	5318862552	211034334
5				2397128348-	1616023248-	2890978248	4279717552	211034335

COEF	L A	PYLON	POSITION	COSINE	SINE	MAX	PHI	
STEADY				9277083349				211034340
1				1407035048-	1487299849	1493940549	9540429252	211034341
2				5159580549	1892987349-	5495877749	1699262753	211034342
3				3050001748	4574993348-	5498461148	1012300453	211034343
4				1957083049-	6603453348	2065485449	4033873552	211034344
5				3167943348-	3427023348	4666942748	2655006552	211034345

COEF	RED	PITCH LINK	COSINE	SINE	MAX	PHI		
STEADY				1601375053-				211034370
1				1271460053-	2168253353-	2513549953	2396127253	211034371
2				9283326752-	9647523852	1338861053	6694893952	211034372
3				7890833352-	4641668752	4154798652	4984481552	211034373
4				1392499753-	9647523352	1694049153	3632124952	211034374
5				3067071052-	4044195352	5075671552	2543525352	211034375

COEF	WHITE	PITCH LINK	COSINE	SINE	MAX	PHI		
STEADY				1798200053-				211034380
1				1128865953	2861230853	3075137153	6850351652	211034381
2				6074999352-	6313328352	8761491352	6694893952	211034382
3				1409399453	1020600453-	1740124153	1080300953	211034383
4				1044899853-	2146530753	2387343653	2898903852	211034384
5				6408652252-	6742310352-	9302127252	4529067352	211034385

IBM TAB NO. 13d  
MANEUVER CONDITION NO. 34 - SYMMETRICAL PULL-UP  
REVOLUTION 4

		40		DELTA PER CENT	PRESSURE RADIUS		
		PER CENT CHORD	K	D E G 120°K	R E E S 30°+120°K	60°+120°K	90°+120°K
TIME	307						
4	0	2947560051	4035350051	3123010051	3965170051		
	1	3719540051	4245890051	4351160051	2210670051		
	2	5965300050	7719800050	1052700051	1824680051		
17	0	1545300051	1890720051	1563480051	1908900051		
	1	1927080051	2145240051	2145240051	1416040051		
	2	5454000050	3817800050	6776600050	1036260051		
34	0	7440000050	9840000050	7440000050	9720000050		
	1	9600000050	1068000051	1092000051	1512000051		
	2	3720000050	2280000050	2640000050	4560000050		
63	0	2853500050	3668100050	3029100050	4038800050		
	1	4214400050	4916800050	4697300050	2677900050		
	2	3292500050	1097500050	1516500050	2370600050		
90	0	1390500050	1328700050	1050600050	1328700050		
	1	1637700050	1977600050	2317500050	2163000050		
	2	3708000050	1266500050	9270000049	1452300050		

		55		DELTA PER CENT	PRESSURE RADIUS		
		PER CENT CHORD	K	D E G 120°K	R E E S 30°+120°K	60°+120°K	90°+120°K
TIME	307						
2	0	6589440051	5160960051	5852160051	5575680051		
	1	5391360051	7741440051	7695360051	5575680051		
	2	2810880051	1612800051	2903040051	5022720051		
9	0	1772350051	3454200051	3726900051	3681450051		
	1	3408750051	4545000051	4226850051	3317850051		
	2	1408950051	1636200051	1590750051	2817900051		
17	0	2737020051	2596660051	2807200051	2912470051		
	1	2701930051	3403730051	3087920051	2456300051		
	2	1614140051	1579050051	1298330051	2140490051		
23	0	2169160051	2098040051	2240280051	2133600051		
	1	2062480051	2595880051	2453640051	1884680051		
	2	1529080051	1280160051	1066800051	1671320051		
34	0	1900800051	1887600051	1966800051	2006400051		
	1	1940400051	2244000051	2098800051	1650000051		
	2	1716000051	1161600051	1042800051	1478400051		
63	0	6064100050	5657300050	6267800050	6308500050		
	1	6267800050	7407400050	7081800050	5616600050		
	2	1298330051	3622300050	3093200050	4395600050		
90	0	2643300050	2082600050	2483100050	2296200050		
	1	2536500050	2910300050	2723400050	2696700050		
	2	1842300050	2830200050	1602000050	2136000050		

		75		DELTA PER CENT	PRESSURE RADIUS		
		PER CENT CHORD	K	D E G 120°K	R E E S 30°+120°K	60°+120°K	90°+120°K
TIME	307						
2	0	1014155052	6839650051	6886820051	6462290051		
	1	6084930051	6933990051	8018900051	8396260051		
	2	9056640051	4150960051	4433980051	1009438052		
9	0	6101280051	4364110051	5550470051	5296250051		
	1	4787810051	5253880051	5042030051	4914920051		
	2	4364110051	2118500051	2584570051	6058910051		
17	0	3522840051	2727360051	2897820051	2698950051		
	1	2386440051	2670540051	3238740051	3096690051		
	2	2727360051	1193220051	1590960051	3494430051		
23	0	3264660051	2901920051	3186930051	3083290051		
	1	2772370051	3031470051	3264660051	2979650051		
	2	2409630051	1295500051	1580510051	3290570051		
34	0	1875060051	1477320051	1846650051	1789830051		
	1	1534140051	1818240051	2017110051	1818240051		
	2	1342090051	8523000050	8238900050	2045520051		
63	0	8268900050	7884300050	6153600050	7115100050		
	1	6538200050	8333000050	9615000050	8781700050		
	2	8653500050	7115100050	5547300050	1019190051		
90	0	6106300050	3479000050	3401500050	3976000050		
	1	3869500050	4215000050	4757000050	4224500050		
	2	8129500050	6070500050	4124000050	6958000050		

TIME	CONT. 11		K	85 11201K	DELTA PER CENT DEG 30+11201K	PRESSURE RADIUS REES 60+11201K	90+11201K
	PER CENT CHORD						
2		0		9958800051	8133020051	7303120051	5477340051
		1		4481460051	6058270051	8547970051	9543850051
		2		1029076052	9045910051	6307240051	1120365052
4		0		1004457052	8088990051	7200090051	5333400051
		1		4355610051	6044520051	8533440051	8889000051
		2		9777900051	7200090051	5333400051	1048902052
9		0		6506550051	6027120051	5890140051	4314870051
		1		3424500051	4657320051	5410710051	5547690051
		2		5273730051	4383360051	3219030051	7396920051
13		0		4259600051	4676300051	5278200051	4120700051
		1		3379900051	4444800051	4259600051	4213300051
		2		4120700051	3194100051	2407600051	5787500051
17		0		3529440051	3627480051	5196120051	4019640051
		1		3431400051	3333360051	4117680051	3529440051
		2		3235320051	2156880051	1764720051	4313160051
23		0		2872830051	2938620051	5636010051	5241270051
		1		2543880051	2828970051	3311430051	3201780051
		2		3004410051	2105280051	1842120051	3859680051
34		0		1302850051	1853350051	2018500051	1743250051
		1		1284500051	1798300051	2257050051	2257050051
		2		1926750051	1321200051	1156050051	2605700051
47.7		0					
		1					
		2					
63		0		4569600050	6378400050	3617600050	3998400050
		1		2284800050	5426400050	8282400050	8758400050
		2		7996800050	7996800050	7330400050	1275680051
77		0		2844000050	1422000050	6636000049-	3792000049-
		1		8532000049-	1327200050	3602400050	4550400050
		2		5688000050	6446400050	4171200050	1004880051
90		0		2546100050	9430000049-	2074600050-	2546100050-
		1		2263200050-	1225900050-	1886000049	1037300050
		2		3583400050	3772000050	3866300050	6129500050

CONT. 34		90		DELTA PER CENT	PRESSURE RADIUS		
PER CENT CHORD	K	(120)K	D E G 30+(120)K	R E S 60+(120)K	90+(120)K		
TIME	307						
2	0	1015872052	7089940051	6772480051	5185180051		
	1	3703700051	5714280051	8359780051	9841260051		
	2	1079364052	1058200052	7407400051	1085946052		
9	0	8110960051	5069350051	4608500051	3410290051		
	1	2304250051	3686800051	5345860051	4885010051		
	2	5161520051	4792840051	3133780051	7742280051		
17	0	5088620051	5680320051	5680320051	4851940051		
	1	3195180051	4260240051	4733600051	4733600051		
	2	4851940051	4378580051	2840160051	5917000051		
23	0	3529440051	3284340051	6323580051	5490240051		
	1	4166700051	2647080051	3186300051	3235320051		
	2	3182180051	2892180051	1764720051	4117680051		
34	0	2148320051	1407520051	2296480051	1740880051		
	1	6296800050	1296400051	1963170051	1889040051		
	2	2574240051	1592720051	5926400050	2555760051		
63	0	4938000050	4773400050	1152200050	1316800050		
	1	2469000050	4115000050	7077800050	8559200050		
	2	7746700050	6748600050	5225600050	1117280051		
90	0	1947000050-	3894000050-	6203000050-	5929500050-		
	1	4336500050-	1593000050-	8850000049	1858500050		
	2	3097500050	4956000050	1858500050	5133000050		

		45		DELTA PER CENT	PRESSURE RADIUS			
PER CENT CHORD	K	(120)K	D E G 30+(120)K	R E S 60+(120)K	90+(120)K			
TIME	307							
2	0	9999600051	5384400051	5192100051	3461400051			
	1	2307600051	3942150051	6345900051	7499700051			
	2	9615000051	9711150051	6730500051	1076880052			
9	0	8516410051	4497450051	4401740051	2775010051			
	1	2009490051	3540550051	5262950051	5645710051			
	2	5645710051	5454350051	4018980051	6602610051			
17	0	4736700051	4736700051	4631440051	3157800051			
	1	2105200051	3052540051	3684100051	3789360051			
	2	3999880051	3894620051	2420960051	4631440051			
23	0	3402300051	2989900051	5361200051	4072450051			
	1	3247650051	2216650051	2577500051	2835250051			
	2	2886800051	2835250051	1546500051	4072450051			
34	0							
	1							
	2							
63	0	3355200050	4194000050	2796000049	1258200050			
	1	2376600050	4473600050	7129800050	7828800050			
	2	8108400050	7549200050	6011400050	9925800050			
90	0	1479000050-	5220000049-	1740000050-	1044000050-			
	1	2610000049-	4785000049	1044000050	1348500050			
	2	1218000050	1000500050	2436000050	2305500050			



		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	40	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		1112546952				307034100
2		2285256751-	4970437251	5470616451	1146915553	307034101
3		2835610251	2111799750	2843463151	2129599151	307034102
4		1871458050-	7500383349-	2016162850	6727993652	307034103
5		3721574050	684758350	7793533750	1536909952	307034104
		2549266350-	5269635350	5853871850	2316321752	307034105

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	55	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2088577552				307034200
2		2415453551-	4991274851	5545019451	1158239853	307034201
3		3475858851	6858183350	3542871951	5580802351	307034202
4		5762155050	2510466749-	5767621250	1191684353	307034203
5		5415113350	1777319851-	1857982851	7173621352	307034204
		3095953350	5563546750	6366944250	1218106452	307034205

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	75	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2609166352				307034300
2		6835116749-	2205956751	2407015451	9177473652	307034301
3		5305746851	1128317051	5424393851	6002819351	307034302
4		2087952551	3553623251-	4121624051	1001455453	307034303
5		1764088350	3525235851-	3529646951	6821620152	307034304
		8403070050-	1907225050-	9266992650	4098748552	307034305

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	85	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2580592352				307034400
2		1803704051	1639066851-	2437188651	3177378753	307034401
3		3349092351	2587974851	4232497351	1884733552	307034402
4		4660903350-	3232821851-	3266248251	8726531752	307034403
5		2713196750-	4147705251-	4156569751	6656434152	307034404
		1886372751-	1214016051-	2243264851	4255283852	307034405

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	90	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2728031352				307034500
2		2777259351	5247686551-	5937287551	2978893653	307034501
3		4309777551	3078991851	5296637951	1777138952	307034502
4		8299793350	2991615051-	3104613751	9516862952	307034503
5		1543172751	4792179851-	5034517851	7196238852	307034504
		1668768051-	2050269051-	2643556251	4617139152	307034505

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	95	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		1984989852				307034600
2		2524351551	5485367751-	6038345051	2947117753	307034601
3		3136598851	1871230751	3652363151	1540972052	307034602
4		8564770050	1230366051-	1499117551	1016141353	307034603
5		1044523251	2527681551-	2734995951	7311301952	307034604
		5909868350-	1390183851-	1510588151	4939379552	307034605

		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	15	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2930816754				307034210
1		6916616054	9711676754	1192292955	3054583253	307034211
2		2027666554	1580410254	2570822454	1089668453	307034212
3		1013834754	1013831354	143476454	1050000353	307034213
4		1317983354	7024053353	1493670254	7011728851	307034214
5		3931498854	1702394254	4284161954	4682764251	307034215
RED BLADE	BEAM	BENDING	28	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1494181354				307034220
1		1936600854	3334438254	3856021454	3001475053	307034221
2		6182749254	4079558753	7407173853	1067070053	307034222
3		4710671753	2355325753	5466686553	1111450253	307034223
4		5888701752	9099418352	7789490652	5522334952	307034224
5		2801507054	1841802753	7605550554	7517448750	307034225
RED BLADE	BEAM	BENDING	36	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2346250053				307034230
1		1294600354	2867892054	3146635154	2942984053	307034231
2		4584497353	1701738853	4699615053	7981870552	307034232
3		6222507253	1310004353	6356901653	3967894051	307034233
4		1965006553	1701738853	2599450053	5522334252	307034234
5		1521698954	1451077853	1528601954	7053055852	307034235
RED BLADE	BEAM	BENDING	45	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		8550900053				307034240
1		1331664054	3025816654	3305897054	2937542653	307034241
2		9245997553	2390229853	3949956553	8275275352	307034242
3		496830753	4672002053	6633443153	1445447252	307034243
4		3726364553	2390228353	4426770953	5170034552	307034244
5		6665083351	3965733253	3966327453	5180165152	307034245
		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	60	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		3578226754				307034250
1		1449370154	2578584254	2556001054	2993394653	307034251
2		1617886154	5409776752	1618790354	9045755552	307034252
3		1249344953	7246132553	7353045253	2673919452	307034253
4		6871414552	1622931653	1762404953	6176310952	307034254
5		1536824854	2199233253	1552480954	3762877552	307034255
RED BLADE	BEAM	BENDING	65	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4270348354				307034260
1		1266919154	2912710854	3176313654	2935072253	307034261
2		1613726854	1234765253	1616443954	9218777652	307034262
3		5184656752	4925431653	4952644253	3200300152	307034263
4		1231348353	2357278553	2659507653	7439519652	307034264
5		1876119054	1662663552	1876192754	5610155252	307034265
RED BLADE	BEAM	BENDING	80	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4838129254				307034270
1		2571096553	1624680054	1842705254	2619794553	307034271
2		1600861954	1447633253	1607393954	9258355852	307034272
3		3214581853	1800163053	3684307753	9749596651	307034273
4		8357823352	3006622253	3120626453	1861627752	307034274
5		2417424854	2688206853	2432325554	3473094252	307034275
RED BLADE	BEAM	BENDING	92.5	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2365416754				307034280
1		3872369353	5616267353	6821854753	2354140653	307034281
2		2691664053	2468171853	3651975853	1112599353	307034282
3		3166641752	7916681752	8526515652	9726707552	307034283
4		3166635752	5484827053	5493960653	2167393252	307034284
5		1401930054	6724593253	1554866354	3087490252	307034285

## HARMONIC ANALYSIS

WH. BLADE	BEAM BEND	15 0/0 R	SINE	MAX	PHI	
COEF		COSINE				
STEADY		3312250054				307034410
1		4097332354	5919135554	7198909454	1246916953	307034411
2		2853500754	1964284554	3464231454	1072713553	307034412
3		6950828353	1938916354	2059741954	3657409152	307034413
4		1756001054	8237343553	1396076554	6282780251	307034414
5		4097332254	7974698053	4174217254	3820277452	307034415

WH. BLADE	SEAM BEND	2 0/0 R	SINE	MAX	PHI	
COEF		COSINE				
STEADY		2791443354				307034420
1		9353769053	3714280554	3830249354	1041350353	307034421
2		1733958754	2162379753	1747390054	8644574152	307034422
3		1137476654	4716367353	1231379054	6750685652	307034423
4		2635619353	4084442753	4661025653	7570628352	307034424
5		2088644854	2741073853	2106554554	3749532052	307034425

		HARMONIC		ANALYSIS		
RED BLADE	CHORD	BENDING	15	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4873458355				307034110
1		2693703355	2949987555-	3994804655	3123999453	307034111
2		1572076054	3889908353-	1619486654	1730510153	307034112
3		1347492254-	8666666748	1347492254	5999987752	307034113
4		1572086754-	1944940854-	2500850154	5776289052	307034114
5		8072036754-	1492617854-	8208878454	3809527152	307034115
RED BLADE	CHORD	BENDING	28	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4784270855				307034120
1		2090282255	2193611055-	3030051055	3136182853	307034121
2		3091367854	1274863554-	3343924654	1687945153	307034122
3		8832430053-	1766492854-	1974997554	8114501152	307034123
4		7360378353	3824577854-	3894758954	7022334152	307034124
5		7654071754-	1028383554-	7722848454	3753046252	307034125
RED BLADE	CHORD	BENDING	60	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2602107555				307034130
1		7512375354	6676495054-	1005044155	3183714653	307034131
2		4068186354	6647473353-	4122138954	1753599153	307034132
3		1074614054-	5219564054-	5329037754	8612212952	307034133
4		2302715053	4919121754-	4924508454	6817003852	307034134
5		5516657554-	2688017754-	6136688854	4119557652	307034135
RED BLADE	CHORD	BENDING	80	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1752053855				307034140
1		2266221854	2523907854-	3392030754	3119207453	307034141
2		1489438754		1489438754		307034142
3		3135648353-	2586923354-	2605857854	8769627352	307034143
4		2351738353	2172451754-	2185143754	6904459552	307034144
5		2893353554-	1709239754-	3360505054	4211446852	307034145
WH. BLADE	CHORD BEND	15 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		4209590055				307034430
1		3306786555-	1570920755	3669586655	1543074453	307034431
2		1439642555	9784755554-	1740685255	1628987053	307034432
3		9840601354	7289334754	1224629955	1217628652	307034433
4		6013691554-	5997113254	8492929554	3376977252	307034434
5		3546082254	1273327853	3548367754	4112988650	307034435
WH. BLADE	CHORD BEND	28 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		4894980055				307034440
1		2057708855-	2285893255	3075625755	1319928253	307034441
2		5998682053	6234071753-	8651464453	1569488153	307034442
3		1679652854	1679652054	2375387254	1499999652	307034443
4		3599335053	3117040054-	3137752554	6914673652	307034444
5		8099706554	4162271253	8110393954	5883450450	307034445
		HARMONIC		ANALYSIS		
RED BLADE	TORSION	15 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		4684831754-				307034350
1		8338055353-	1753083354-	1941270954	2445632053	307034351
2		8237053753-	8916888253	1213919154	6636524452	307034352
3		1029635353-	1235559954	1739842654	3158788552	307034353
4		1029627553-	2140052354	2142527754	2318862852	307034354
5		2987922853-	2086317753	3644228953	2901506552	307034355
RED BLADE	TORSION	50 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1306040054-				307034360
1		4694934553-	1128365654-	1222142854	2474086553	307034361
2		5959595353-	2635489053	6516331653	7807187252	307034362
3		2155599253-	9002801253	9257269453	3448840252	307034363
4		3246795353-	1383631454	1422365854	2585051152	307034364
5		2279068253-	4109651753	4875166753	2357423652	307034365

		HARMONIC		ANALYSIS	
RED BLADE	PITCH	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		1688613952			
1		1768314351	6719718551-	6948492951	2847433153
2		4853150049-	1849208350-	1911832150	1276473353
3		7764900049	4076425050-	4149720250	9359489752
4		5726438350-	5043066749-	5748601750	4625821452
5		2153798350-	1391665050	2564289150	2942634052
307034510					
307034511					
307034512					
307034513					
307034514					
307034515					
RED BLADE	FLAP	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		3546666750-			
1		1843118351-	7344895850	1984076651	1582725653
2		1773330049-	3071515049	3546675149	5999993552
3		2128000850-	1773331350	2770034550	4673149252
4		3546681749	1166666744-	3546681749	8999995352
5		3380814750-	2804361749	3392425750	3505164352
307034520					
307034521					
307034522					
307034523					
307034524					
307034525					
VERTICAL	ACCEL	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		1235987551			
1		2016400049	5299586049-	5670227649	2908309553
2		2182231849	3076556749	3771914249	2732577352
3		2029866748-	5075133348	5466016648	3726653352
4		1370237749-	1186672750	1194557550	2414667952
5		1840620049	3261056748	1869285149	2009385951
307034530					
307034531					
307034532					
307034533					
307034534					
307034535					
FORE-AFT	ACCEL	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		9309083349-			
1		8547088348	7524513548	1138731849	4135939652
2		2974502849	8777456349	9267761649	3563975752
3		8813353348-	1872832049	2069843449	3840039852
4		7050666549-	1717327549	7256797649	4157776252
5		1625876749-	2016183248-	1638329949	3741378752
307034540					
307034541					
307034542					
307034543					
307034544					
307034545					
LATERAL	ACCEL	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		8450000048			
1		2260339249	1287576949-	2601343449	3303324853
2		1335079950	3024738749-	1368934750	1736174253
3		1239331949	5000000042-	1239331949	1200000053
4		8449968346	7317914749-	7366538949	6914669052
5		8943263348	2735773048	9352347948	3401808151
307034550					
307034551					
307034552					
307034553					
307034554					
307034555					
LIFT LINK	LOAD	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		5950035054			
1		1894772853	2205889753-	2907939753	3106612953
2		2408356053-	4334963553-	4959041053	1204724853
3		9443850051-	4722326752	4815831452	3376966752
4		3825016553-	4498553353	5904890653	3259343852
5		7496986752	4114435052	6551805952	5751700551
307034610					
307034611					
307034612					
307034613					
307034614					
307034615					
RIGHT	CYCLIC	LOAD			
COEF		COSINE	SINE	MAX	PHI
STEADY		1490666753			
1		3454220752	2287334552	4142890352	3351194552
2		1230666553-	1711266353	2107835953	6286101152
3		3466629751-	3466666751-	4902580951	7500010252
4		22533315252	3302444352	3997956752	1392334252
5		1052448852	4860040051	1159244852	4957347451
307034620					
307034621					
307034622					
307034623					
307034624					
307034625					
LEFT	CYCLIC	LOAD			
COEF		COSINE	SINE	MAX	PHI
STEADY		3196000052-			
1		2531253752-	2255996552	3390688152	1382907753
2		1879999253-	9117516852	2089422953	7706390152
3		1879997252-	1666666745	1879997252	5999999852
4		2632000553	7815011852	2745572953	4134339951
5		1228745552-	22559991852	2568913152	2371506152
307034630					
307034631					
307034632					
307034633					
307034634					
307034635					
COLLECTIVE	LOAD	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		1157333352			
1		1245936352	3020299752-	3267195752	2924171753
2		6117329052	6013680852-	8578232452	1577447653
3		3306665752	3306673351	3323158052	1903535551
4		1504533453-	2863666751	1504805953	4472739852
5		2391396552	3593028752-	4316089952	6072927552
307034640					
307034641					
307034642					
307034643					
307034644					
307034645					
STABILIZER	BAR	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		6031666749-			
1		2787878851-	4741342051-	5500235651	2395447553
2		5170000049	8954693349-	1033999250	1500000153
3		1551004550	2067997250-	2585000550	1022900153
4		1378663550	3333333344	1378663550	3463244246
5		4777786749	2434418850	2480860250	1577925352
307034650					
307034651					
307034652					
307034653					
307034654					
307034655					

## HARMONIC ANALYSIS

COEF	R F	PYLON	POSITION	COSINE	SINE	MAX	PHI	
STEADY								
1				3810416749				307034310
2				2260727348-	2440874348-	3326830848	2271920053	307034311
3				4007082049-	4981811349	6343367749	6440560252	307034312
4				9833261747-	1474796748-	1772722748	7877002152	307034313
5				1229155748-	2545349748	7670178148	2562993252	307034314
				2740718347	7676851347	1007468448	1461267752	307034315

COEF	R A	PYLON	POSITION	COSINE	SINE	MAX	PHI	
STEADY								
1				1277500050				307034320
2				4415068848-	5281103848	6883523148	1298960553	307034321
3				1449999349	6321985849	6486139249	3854108452	307034322
4				1499989348-	8166666742	1499989348	5999990052	307034323
5				6999986748-	1732052049	186815-849	2800145352	307034324
				8490433348-	7810820047-	7856830447	5275925152	307034325

COEF	L J	PYLON	POSITION	COSINE	SINE	MAX	PHI	
STEADY								
1				1450000049-				307034330
2				4565070348	5946154248-	7557753048	3081160553	307034331
3				1674998549	6711697349-	8917550249	1420061753	307034332
4				2499997848	1500003548	2915475948	1032128052	307034333
5				2750005748-	3031049048-	4092680148	5894589952	307034334
				3349253347	4446151248	4458748148	1713841752	307034335

COEF	L A	PYLON	POSITION	COSINE	SINE	MAX	PHI	
STEADY								
1				9150000049				307034340
2				3812506748	8123428347-	3898090348	3479716953	307034341
3				6176247049	4534364849-	7662016149	1618576653	307034342
4				3050003348	1016678348	3214989148	6145042351	307034343
5				5337496348-	8364371748	9922277048	3063572052	307034344
				3812510048	1829024348	4228541548	5125805851	307034345

COEF	RED	PITCH LINK	POSITION	COSINE	SINE	MAX	PHI	
STEADY								
1				1601375053-				307034370
2				1685430853-	1616252253-	2335154953	2237996953	307034371
3				1508540653-	1567722653	2175649153	6694893952	307034372
4				1392496552-	1299666653	1407105153	3203849852	307034373
5				7658758252	9245540352	1200569053	1259064152	307034374
				1128430453	8331683350-	1178461253	7191539452	307034375

COEF	WHITE	PITCH LINK	POSITION	COSINE	SINE	MAX	PHI	
STEADY								
1				1433700053-				307034380
2				1660998253	2419531753	2934799653	5553056652	307034381
3				8747998052-	3367107052	9373626852	7947414052	307034382
4				2916004552-	1409400253-	1439249753	8610353752	307034383
5				7775998352	6734211752	1028667953	1022334852	307034384
				1167497853-	492675752	1426416853	3274904152	307034385

IBM TAB NO. 13e  
MANEUVER CONDITION NO. 34 - SYMMETRICAL PULL-UP  
REVOLUTION 5

		40		DELTA PER CENT	PRESSURE RADIUS	
		PER CENT CHORD	K	D E G 30+(120)K	R E E S 60+(120)K	90+(120)K
TIME	422					
4	0	2737020051		3228280051	3228280051	3894990051
	1	3509000051		3509000051	3579180051	2456300051
	2	1157970051		6316200050	9825200050	1754500051
17	0	1436220051		1581660051	1490760051	1872540051
	1	1745280051		1799820051	1818000051	1145340051
	2	6181200050		3454200050	5817600050	9817200050
34	0	6840000050		7920000050	7320000050	9480000050
	1	8520000050		8880000050	9120000050	8280000050
	2	5880000050		2160000050	2520000050	4440000050
63	0	2897400050		3160800050	2853500050	3731500050
	1	3599800050		3863200050	4214400050	3029100050
	2	2897400050		1975500050	1273100050	2107200050
88	0	1081500050		1050600050	1081500050	1390500050
	1	1452300050		1606800050	1946700050	1977600050
	2	1761300050		8034000049	7416000049	1019700050
				55	DELTA PER CENT	PRESSURE RADIUS
		PER CENT CHORD	K	D E G 30+(120)K	R E E S 60+(120)K	90+(120)K
TIME	422					
2	0	6451200051		5990400051	5160960051	5299200051
	1	5207040051		6773760051	6451200051	5529600051
	2	4285440051		1428480051	2856960051	4700160051
9	0	3636000051		3499650051	3116050051	3454200051
	1	3272400051		4135950051	3726900051	3090600051
	2	2454300051		6363000050	1590750051	2636100051
17	0	2666840051		2666840051	2491390051	2666840051
	1	2561570051		3052830051	2737020051	2280850051
	2	1824680051		8070700050	1228150051	1965040051
23	0	2026920051		2026920051	1884680051	1955800051
	1	1884680051		2382520051	2098040051	1706880051
	2	1457960051		7467600050	1031240051	1564640051
34	0	1821600051		1848000051	1755600051	1848000051
	1	1782000051		2072400051	1874400051	1570800051
	2	1320000051		8976000050	1016400051	1425600051
63	0	5535200050		5172400050	5006100050	5575900050
	1	5372400050		6674800050	6267800050	5087500050
	2	4110700050		4110700050	2564100050	4354900050
90	0	2002500050		1895700050	2002500050	2242800050
	1	2216100050		2696700050	2483100050	1922400050
	2	2269500050		2696700050	1201500050	1842300050
				75	DELTA PER CENT	PRESSURE RADIUS
		PER CENT CHORD	K	D E G 30+(120)K	R E E S 60+(120)K	90+(120)K
TIME	422					
2	0	9386830051		7735880051	5518890051	5707570051
	1	5754740051		5943420051	7028330051	7075500051
	2	8632110051		7735880051	5943420051	5245320051
9	0	4957290051		4787810051	4067520051	4448850051
	1	4364110051		4321740051	4194630051	4321740051
	2	4533590051		3982780051	3601450051	4957290051
17	0	3238740051		3238740051	2102340051	2159160051
	1	2215980051		2358030051	2670540051	2727360051
	2	2926230051		2528490051	2244390051	3181920051
23	0	2953740051		3368300051	2513270051	2694640051
	1	2591000051		2487360051	2824190051	2668730051
	2	2720550051		2202350051	2150530051	3005560051
34	0	1619370051		1931880051	1306860051	1477320051
	1	1448910051		1505730051	1676190051	1590960051
	2	1647780051		1278450051	1250040051	1846650051
63	0	8974000050		7435600050	5833100050	6345900050
	1	6025400050		7435600050	8076600050	8333000050
	2	7884300050		6986900050	5640000050	8589400050
90	0	5183000050		3408000050	3514500050	3656500050
	1	5621000050		4473000050	4331000050	3798500050
	2	3976000050		5003500050	2591000050	3798500050



TIME	PER CENT CHORD	K	DELTA PER CENT		PRESSURE RADIUS	
			1201K	10+11201K	60+11201K	90+11201K
		422				
	2	0	1062272052	8299000051	4896410051	4647440051
		1	4232490051	5062390051	7220130051	8547970051
		2	1004179052	9192820051	8181990051	1078870052
	4	0	1066680052	8355660051	4622280051	4355610051
		1	4177830051	4977840051	6933420051	7377870051
		2	9333450051	9244560051	7555650051	1075569052
	9	0	8766720051	6917490051	3903930051	3698460051
		1	3356010051	3766950051	4931280051	5068260051
		2	5273730051	4862790051	4588830051	6643530051
	13	0	4907800051	5602300051	3426200051	3611400051
		1	3194700051	2824300051	3518800051	3704060051
		2	4120700051	3657700051	3379900051	4768900051
	17	0	4117680051	4019640051	3137280051	3431400051
		1	2843160051	2647080051	3333360051	3137280051
		2	3333360051	2745120051	2745120051	3921600051
	23	0	3377220051	3333360051	2653530051	4407930051
		1	2346510051	2478090051	2807040051	2872830051
		2	3070200051	2521950051	2565810051	3486870051
	34	0	2073550051	1853350051	1266150051	1559750051
		1	1229450051	1541400051	1926750051	2036850051
		2	2091900051	1559750051	1578100051	2169300051
	47.7	0				
		1				
		2				
	63	0	5426400050	6283200050	2475200050	3522400050
		1	2094400050	4379200050	6664000050	7901600050
		2	9234400050	8472800050	5521600050	8758400050
	77	0	2275200050	1137600050	1516800050	4740000049-
		1	1137600050-	8532000049	2559600050	3886800050
		2	5024400050	6920400050	3886800050	5308800050
	90	0	5658000049	1037300050-	2546100050-	2451800050-
		1	2546100050-	1320200050-	1886000049-	7544000049
		2	2168900050	4243500050	2169900050	2829000050



		HARMONIC		ANALYSIS		
COEFF	BLADE	LOADING	40	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1	1003988152	1684836251-	4423095051	4733121851	1108527453	422034100
2	1741918551	3864285750	1784266551	6253990251	422034101	
3	1299790050	4719772550-	4695478150	9513238952	422034102	
4	5171840250	1214964550	5312633150	3305040951	422034103	
5	2374212850-	4818630750	5371786550	2324605552	422034104	

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	55	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1	1898850152	1500577551-	5074711251	5291920951	1064728053	422034200
2	3890706051	4714133350	5219402151	3668766251	422034201	
3	1940066750	2725031750-	8394687350	1136859453	422034202	
4	1195420049	8131766750-	8163543550	6876425852	422034203	
5	243735050	7836245050	1013372251	1521658652	422034204	

		HARMONIC		ANALYSIS		
COEFF	BLADE	LOADING	75	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2481407452				422034300
2		1155199051	9814753150-	1515842551	3196482553	422034301
3		2794278551	8866240050	2931568151	8852102651	422034302
4		2004899051	3561871750-	7036293051	1166420153	422034303
5		4713506750	7430786350-	8795645450	7559695752	422034304
6		1252156851-	1176015050	1257667251	3492691452	422034305

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	85	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1	2419799252	3546046551	4994976751-	6125703151	3053718153	422034400
2	3075387551	1509272251	3425771651	1306794252		422034401
3	2028567851	9220275050-	2228277851	1118524053		422034402
4	1395870851	5955598350-	1517612251	8422351952		422034403
5	1455750551-	7699553350	1646827551	3042507352		422034404

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	90	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2555733752				422034500
2		4621928251	8319445151-	9517113951	2990546753	422034501
3		3718063251	1214565751	3911414651	9045233851	422034502
4		2305465051	1534340251	2769350251	1087848253	422034503
5		1423810851	9539703350-	1713854351	8154436352	422034504
6		1724602751-	3122491350	1752640351	3394755452	422034505

		HARMONIC		ANALYSIS		
COEFF	BLADE	LOADING	95	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
		1898250052				422034600
1		4175711051	6330720251-	7583836651	3034086553	422034601
2		3139861251	1122330251	3334419651	9834608651	422034602
3		2242699051	5842660050-	2317556451	1151326353	422034603
4		1184863151	5796623350-	1319056351	8348276552	422034604
5		1049127851-	1100733350-	1054886351	3719790052	422034605

		HARMONIC		ANALYSIS	
RED BLADE	BEAM	BENDING	15	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		2695958354-			422034210
1		5920980354-	8570270354-	1041669555	3046396153
2		1165907154-	1141407454-	1631609754	1121958253
3		7096838353	1013831954-	1237540454	1016640353
4		5069137352-	6146038253	6166907553	2367874652
5		6447783554	5609871853	6472141854	9944955750

RED BLADE	BEAM	BENDING	28	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		6403750053			422034220
1		1812002354	3219068554-	3694016054	2993750153
2		6329957353-	2549738352-	6335090553	9115332952
3		3573005553	1177661753-	3724112653	1138550553
4		4416265052	1274860053-	1349185753	7227667352
5		2780896854	8733226753-	2914803554	6851309152

RED BLADE	BEAM	BENDING	36	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		5130000053-			422034230
1		1197726154	2534283054-	2803058754	2952558653
2		4748749753-	2836242352-	4757212153	9170960152
3		4912504253	9825016752	5009791253	3769980851
4		1637514852-	8508692252-	8664831152	6477662652
5		1651522754	1007716654-	1932089054	6574722352

RED BLADE	BEAM	BENDING	45	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		8826000053-			422034240
1		1107794654	2790138854-	3002013254	2916550253
2		1035000054-	9560925052-	1039406654	9263889452
3		4140004553	1932001253	4568617553	8338961351
4		2208005353-	2151205753-	3082689353	5606337452
5		1756041853	9496612053-	9657604453	5609527452

		HARMONIC		ANALYSIS	
RED BLADE	BEAM	BENDING	60	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		3513240054-			422034250
1		6607363753	2628316854-	2710096354	2841112653
2		1355526154-	9737591752-	1359019254	9205443152
3		8745335352	4122799253	4214532253	2600795452
4		2811008853-	1190149753-	3052577153	5073681652
5		2022510754-	3795162253	2057810054	3387445252

RED BLADE	BEAM	BENDING	65	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		4162020854-			422034260
1		5078553753	2782255054-	2828225654	2803445353
2		1510033354-	3367538352	1510408854	8936123152
3		1296167553-	7647382753	7756449753	3320657952
4		1490599853-	1010262353-	1800699253	5353192052
5		2478029854-	1213892254	2759377854	3078030752

RED BLADE	BEAM	BENDING	80	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		4535958354-			422034270
1		2591605053	1366915354-	1391266254	2807355853
2		1588003154-	2783911053-	1612220654	9497171452
3		2700253253-	9643749253	1001465354	3521409052
4		1864454353	2338483253	2990768053	1285872952
5		2457936054-	1906963854	3110942054	2843885752

RED BLADE	BEAM	BENDING	92.5	PER CENT	RADIUS
COEF		COSINE	SINE	MAX	PHI
STEADY		2270416754-			422034280
1		3480697253-	2212101053-	4124153753	2124373553
2		7995827253-	9598448352-	8053232653	9342260852
3		3008335853-	5066666253	5892468953	4023325052
4		1345833753-	1508325853	2021463653	3293539552
5		1061097054-	1012876054	1466916754	2726638452

				HARMONIC		ANALYSIS		
WH.	BLADE	BEAM	BEND	15 0/0 R				
COEF				COSINE	SINE	MAX	PHI	
STEADY				2047208754-				422034410
1				4605101854-	6825229354	8733623754	1240093953	422034411
2				2505958554-	1362329754-	2852327254	1047650653	422034412
3				1024334054-	3658240054	1024987054	5731871854	422034413
4				7499583353	1920520753	1090772254	1164091752	422034414
5				6442863054-	2353571053	6447160254	3558159452	422034415
WH.	BLADE	BEAM	BEND	2 0/0 R				
COEF				COSINE	SINE	MAX	PHI	
STEADY				1154586754				422034420
1				1269293054-	2708887554	2991517454	1151062053	422034421
2				6935835353-	9610560352-	7002102553	9194444752	422034422
3				2774334853-	1664602253-	3235403253	1032125952	422034423
4				1942032253	4500000046	1942032253	3319087745	422034424
5				2614772354-	7867724053	2730575954	3265074352	422034425

		HARMONIC		ANALYSIS		
REF. BLADE	CHORD	BENDING	15	PER. CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		5232791755				422034110
1		2659209855	2125654355	3405007655	3213495053	422034111
2		2245826354	1955554054	2732168454	1735754552	422034112
3		174660254	2245824754	2076017254	1711139952	422034113
4		174668854	1779718354	1957871054	5085324952	422034114
5		4972928854	2850766554	1037237655	3280947852	422034115
REF. BLADE	CHORD	BENDING	28	PER. CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		5005083355				422034120
1		2045062755	1877641355	2776295855	3174439153	422034121
2		1619285754	1784806554	2409500554	2389187952	422034122
3		5888270053	1766492754	1867065154	8385505552	422034123
4		1472100053	7649096753	7789444553	5477654852	422034124
5		1014604555	1111420354	1020675455	4474972452	422034125
REF. BLADE	CHORD	BENDING	60	PER. CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2556752555				422034130
1		5462484554	6520961854	8506566854	5099522653	422034131
2		3223846054	1179491353	3226566354	1788192553	422034132
3		8443385053	767613352	8478206753	5826845052	422034133
4		2302761753	7976925053	8302672853	6347447752	422034134
5		8763091754	3994928354	9630743954	4090147052	422034135
REF. BLADE	CHORD	BENDING	80	PER. CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1708938355				422034140
1		1333210254	2694008054	1005849054	2963298853	422034141
2		1019089054	2715566753	1054649454	1725395653	422034142
3		5919561753	8624101753	7472108753	3814793152	422034143
4		1567831753	1377806753	2074062553	3477652352	422034144
5		4233700354	2558231854	4946591654	422853152	422034145
WH. BLADE	CHORD BEND	15 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		5284766755				422034430
1		2730788755	2620497254	4784730655	1361607753	422034431
2		182261553	9469141353	9642887253	3955352352	422034432
3		1093403754	2551268354	2775698454	2226711752	422034433
4		1822446853	9469103053	9642884653	7022351952	422034434
5		1309370655	7252645354	496816655	6620356152	422034435
WH. BLADE	CHORD BEND	28 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		5026952555				422034440
1		2010349555	1838770855	2724441855	1375523353	422034441
2		1199609053	2078017553	239520353	1199993353	422034442
3		4799016753	1679657054	1746866354	2468483852	422034443
4		5998649053	1454617354	1573451454	6189735352	422034444
5		1314496155	4470600854	1388438955	6824336552	422034445
		HARMONIC		ANALYSIS		
REF. BLADE	TORSION	15 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		5148166754				422034350
1		8200109553	1372515254	1598817154	2391437453	422034351
2		3603701853	8025198753	8797187653	5709120552	422034352
3		6177803853	1166666747	617803853	6000000952	422034353
4		5148173152	9808570853	9822012053	2174887552	422034354
5		1066604853	4808263753	4425144353	5149855152	422034355
REF. BLADE	TORSION	50 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1515260054				422034360
1		5268865053	5485157853	7605780153	2261522253	422034361
2		1458198153	3294458352	1494948153	9636527452	422034362
3		1902000353	2535787053	1918832353	5746846952	422034363
4		1838578853	1294345052	1867879253	2739572351	422034364
5		4371193152	2610045253	2666126153	5211263152	422034365

		HARMONIC		ANALYSIS			
RED BLADE	PITCH	POSITION	SINE	MAX	PHI		
COEF		COSINE					
STEADY		1709966852				422034510	
1		1721178851	6292848751-	6523986751	7852970453	422034511	
2		5823716749-	1681098350-	1779114550	1254463753	422034512	
3		3105891750	1747026750-	3563518850	1102142653	422034513	
4		1164705050	2689736750-	2931078550	7335337552	422034514	
5		6460833348	6170613349	6204364549	1680454952	422034515	
RED BLADE	FLAP	POSITION	SINE	MAX	PHI		
COEF		COSINE					
STEADY		3724000050-				422034520	
1		1468513051-	7262594750	1638286751	1536851153	422034521	
2		5319991749-	8333333343	5319991749	8999995952	422034522	
3		2660001050-	2305331850	3519965950	4636188352	422034523	
4		1666666744	3071490049	3071490049	2249992352	422034524	
5		3934867050-	1426736750	4185541350	3201399152	422034525	
VERTICAL	ACCEL	COSINE	SINE	MAX	PHI		
COEF							
STEADY		1117740051				422034530	
1		1545076749	9977445048-	1839227049	3271473653	422034531	
2		3552515049-	2637046749	4424294149	7170667752	422034532	
3		1928488349-	1725488349-	2587735949	7394004952	422034533	
4		3856989749-	5625711749	6820923849	3110863852	422034534	
5		1443556349-	1187378348-	1448431449	3694044152	422034535	
FORE-AFT	ACCEL	COSINE	SINE	MAX	PHI		
COEF							
STEADY		9033666749-				422034540	
1		3726952849-	1425802348	3729679149	1778091353	422034541	
2		2974502349	8014199349	8548394849	3481869452	422034542	
3		3084668749-	1101668249-	3275492949	6655128352	422034543	
4		4847334249-	1908135048	4851088449	4443643552	422034544	
5		2772881749-	1574748249-	3188840749	4191853952	422034545	
LATERAL	ACCEL	COSINE	SINE	MAX	PHI		
COEF							
STEADY		5633333347-				422034550	
1		1554150749	8148115048	1754794149	2766716452	422034551	
2		9970998549	1463583449-	1007784250	1758247653	422034552	
3		1013998749	2253325048	1038733449	4176259651	422034553	
4		1633669049-	3805315849-	4141171649	6169139252	422034554	
5		2021508048-	4245230548	4701965248	2309260352	422034555	
LEFT LINK	LOAD	COSINE	SINE	MAX	PHI		
COEF							
STEADY		5751700554				422034610	
1		1635836752	8938316752-	9066774352	2803711653	422034611	
2		1605573753-	4907505953-	7163475653	1259418153	422034612	
3		2833290052-	2833418352	4006967952	4499956952	422034613	
4		3116680253-	6543400052	3184628153	4203577452	422034614	
5		1635730052-	2395001752-	2900283752	4713356952	422034615	
RIGHT	CYCLIC	LOAD	COSINE	SINE	MAX	PHI	
COEF							
STEADY		8320000052				422034620	
1		1293777552	2680444752	2976347452	6423466652	422034621	
2		3813332852	4201110652	5675178152	2389183052	422034622	
3		1733334052	1039999352-	1021196952	1096787653	422034623	
4		5200003352	1140844753	1253764653	1637408852	422034624	
5		9289198350	1479554652	1482467852	1728149552	422034625	
LEFT	CYCLIC	LOAD	COSINE	SINE	MAX	PHI	
COEF							
STEADY		8836000052-				422034630	
1		9031248351-	1490499752	1742763352	1212125553	422034631	
2		2312399753-	2256271751	2312629053	8959661452	422034632	
3		3760005051	1007998352-	3031407352	9237501252	422034633	
4		1879948351-	1335064853	1335197153	2270168852	422034634	
5		2856873552-	1114507752-	1056569652	4026228952	422034635	
COLLECTIVE	LOAD	COSINE	SINE	MAX	PHI		
COEF							
STEADY		2810666752				422034640	
1		6818928351-	826662051-	1071613252	2304817753	422034641	
2		2479998552	540949852-	7479492352	1472518153	422034642	
3		6613329251-	3306668351	7393928551	5114497552	422034643	
4		2149332252	6586412052-	6728235952	7201874652	422034644	
5		3327225752	826662051-	3428382752	6920941852	422034645	
STABILIZER	BAR	COSINE	SINE	MAX	PHI		
COEF							
STEADY		2412666750-				422034650	
1		3229471251-	1717145750-	3234033151	1830436253	422034651	
2		8616650048	1472433349-	1723317749	1500001253	422034652	
3		1666666745-	6843351749-	6843351749	8499999952	422034653	
4		6041680047	1462756749-	1595175849	7723708352	422034654	
5		2407130052	7231890049-	759075349	5894132152	422034655	

## HARMONIC ANALYSIS

R F	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY			4351250049				422034310
1			8257168848-	5750603048-	1005231949	2148548153	422034311
2			3859582749-	3534105749	5233190449	6876029352	422034312
3			1474991348-	1966662348-	2458324648	7771006652	422034313
4			2212508548	2980575248	3712010548	1335329052	422034314
5			5928218347-	6410570047-	8731505047	4544773852	422034315

R A	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY			1200000050				422034320
1			8062182748-	2598091848	8470470548	1621381253	422034321
2			3499993848	5455960749	5467175049	4216475652	422034322
3			4999883347-	1500007848	1581142548	3614482152	422034323
4			4499987748-	6062187848	7549835148	3164666552	422034324
5			4062206048	2598068348-	4821978548	6547964052	422034325

L F	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY			1500000049-				422034330
1			7446159048	1299041348-	7558622748	3501038953	422034331
2			1724998749	5759069049-	6011863049	1433372053	422034332
3			2999997248	1833333342	2999997248	1167137346	422034333
4			1750006748-	3031089348-	4821830548	5473705952	422034334
5			2946167748-	1299037348	3219841348	3124122452	422034335

L A	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY			7269166749				422034340
1			9553740048	8723136748	1293704249	4239795252	422034341
2			6481247749	3213615049-	7234243949	1668129353	422034342
3			4066665748	1016673348	4191824848	4678778451	422034343
4			7879165348-	3081613348	8460353848	3965977152	422034344
5			1629608348	8146116748-	1631643148	7142765252	422034345

RED	PITCH LINK	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY			2228000053-				422034370
1			2001242753-	7036886552-	2121355753	1993730053	422034371
2			6730408852-	1326534553	1487507253	5845088652	422034372
3			1253250253-	2320832552	1274558253	5650284552	422034373
4			6266243852-	8441580052	1051313853	3164669152	422034374
5			3302423352	1002715252	3451295152	3377974151	422034375

WHITE	PITCH LINK	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY			1919700053-				422034380
1			1899231853	1177210053	2234480953	3179207752	422034381
2			1457999152-	4208885052	4454264752	5455329752	422034382
3			1457999653	5346003752-	1552920053	1132878953	422034383
4			1944004752-	8417766252	8639325352	2575098752	422034384
5			8786317052-	2538101052-	9145563052	3922248252	422034385



IBM TAB NO. 14a  
MANEUVER CONDITION NO. 38 - APPROACH AND FLARE  
REVOLUTION 1

Cond. R		40		DELTA	PRESSURE
PER CENT		PER CENT		PER CENT	RADIUS
CHORD	K	11201K	D E G	R E E S	90+11201K
TIME					
4	0	3614270051	3052830051	2561570051	2772110051
	1	2666840051	2561570051	2421210051	2526480051
	2	2666840051	2175580051	1754500051	2631750051
17	0	1818000051	1545300051	1327140051	1327140051
	1	1399860051	1363500051	1254420051	1236240051
	2	1290780051	1036760051	9271800050	1399860051
34	0	8640000050	7560000050	6720000050	6600000050
	1	6360000050	6240000050	5760000050	6240000050
	2	6720000050	5520000050	3960000050	6840000050
63	0	3555900050	2941300050	3073000050	2677900050
	1	2721800050	2765700050	2677900050	2721800050
	2	3204700050	2590100050	2063300050	3116900050
86	0	1606800050	1174200050	1390500050	1112400050
	1	1143300050	1205100050	1143300050	1112400050
	2	1205100050	1143300050	8961000049	1452300050

PER CENT		55		DELTA	PRESSURE
CHORD		PER CENT		PER CENT	RADIUS
CHORD	K	11201K	D E G	R E E S	90+11201K
TIME					
2	0	5345280051	5345280051	3870720051	4423680051
	1	4746240051	4331520051	4008960051	4147200051
	2	4654080051	4101120051	2764800051	4008960051
9	0	3045150051	3090600051	2363400051	2590650051
	1	2817900051	2545200051	2317950051	2408850051
	2	2727000051	2408850051	1545300051	2363400051
17	0	2245760051	2151030051	1894860051	2035220051
	1	2140490051	2000130051	1894860051	1894860051
	2	2105400051	1965040051	1333420051	1789590051
23	0	1778000051	1813560051	1351280051	1564640051
	1	1635760051	1564640051	1422400051	1422400051
	2	1600200051	1493520051	1031240051	1386840051
34	0	1650000051	1689600051	1399200051	1504800051
	1	1557600051	1452000051	1359600051	1399200051
	2	1531200051	1438800051	1095600051	1372800051
63	0	5128200050	5372400050	4110700050	4680500050
	1	4558400050	4395600050	4110700050	4477000050
	2	4843300050	4558400050	3215300050	4151400050
90	0	1922400050	1708800050	1655400050	1602000050
	1	1708800050	1655400050	1602000050	1762200050
	2	1815600050	1708800050	1361700050	1548600050

PER CENT		75		DELTA	PRESSURE
CHORD		PER CENT		PER CENT	RADIUS
CHORD	K	11201K	D E G	R E E S	90+11201K
TIME					
2	0	6556630051	6320780051	4056620051	6084930051
	1	6462290051	6273610051	5518890051	5707570051
	2	6226440051	7028330051	3679260051	5235870051
9	0	3898040051	4152260051	2584570051	3940410051
	1	4406480051	4237000051	3643820051	3855670051
	2	3728560051	4321740051	2372720051	3347230051
17	0	2414850051	2329620051	1335270051	2358030051
	1	2386440051	2215980051	1903470051	2045520051
	2	2329620051	2698950051	1221630051	1789810051
23	0	2487360051	2435540051	1684150051	2435540051
	1	2487360051	2311900051	2046890051	2150530051
	2	2331900051	2616910051	1450960051	1995070051
34	0	1534140051	1420500051	9375300050	1477320051
	1	1534140051	1477320051	1278450051	1363680051
	2	1420500051	1590960051	7954800050	1193220051
63	0	7435600050	6666400050	4679300050	7307400050
	1	6922800050	6345900050	6089500050	6666400050
	2	6794600050	7820200050	4615200050	5961300050
90	0	3656500050	3408000050	2804500050	3656500050
	1	3761000050	3408000050	3408000050	3514500050
	2	3479000050	3405000050	2769000050	3372500050

TIME	C-ord. IN PER CFNT CHORD	X	DELTA PFA CFNT			PRESSURE RADIUS		
			85			90		
			(120)X	0 F G 30+1120)X		R F F S 60+1120)X	90+1120)X	
		0	6971160051	6556210051		3455580051	7137140051	
	2	1	7469100051	6971160051		5809300051	6407240051	
		2	7386110051	7385110051		3744550051	59111360051	
		0	6400080051	6133410051		3022260051	6488970051	
	4	1	6933420051	6311190051		5333400051	5600070051	
		2	6488970051	6755640051		3644490051	4888950051	
		0	4725810051	4657320051		2465640051	4794300051	
	9	1	5136750051	4794300051		3903930051	4109400051	
		2	4657320051	4794300051		2534130051	3492990051	
		0	3287300051	3102100051		1481600051	3472500051	
	13	1	3611400051	3287300051		2731700051	2916900051	
		2	3626200051	3518800051		1805700051	2407600051	
		0	2843160051	2647080051		1372560051	3039240051	
	17	1	3133600051	2941200051		2451000051	2549040051	
		2	2843160051	2941200051		1568640051	2156880051	
		0	2587740051	2400070051		1666680051	2719320051	
	23	1	2763180051	2565810051		2171070051	2324580051	
		2	2631600051	2719320051		1622820051	2017560051	
		0	1688200051	1486350051		9358500050	1816650051	
	34	1	1853350051	1669850051		1486350051	1578100051	
		2	1779950051	1890050051		1027600051	1321200051	
		0						
	47.7	1						
		2						
		0	6568800050	5140800050		3236800050	6378400050	
	63	1	6281200050	5426400050		5045600050	5902400050	
		2	6854400050	7520800050		4188800050	5236000050	
		0	2180400050	9480000049		1896000049	1990800050	
	77	1	1706400050	1516800050		1327200050	1990800050	
		2	2464800050	2844000050		9480000049	1706400050	
		0	9430000048	7544000049		1603100050	4715000049	
	90	1	6601000049	9430000049		1320200050	5658000049	
		2	1886000049	9430000048		8487000049	2829000049	

Cond. 38		90		DELTA	PRESSURE	
PER CENT	CHORD	K	(120)K	PFR CFNT	R F F S	90+(120)K
TIME						
2	0		7301580051	6666660051	3703700051	7301580051
	1		8148140051	7724860051	6243380051	6560840051
	2		8359780051	8888880051	4761900051	5396820051
9	0		4147650051	3963310051	2119910051	4516330051
	1		5161520051	4700670051	3502460051	3871140051
	2		4885010051	4885010051	2949440051	3041610051
17	0		3905220051	3668540051	2603480051	4260240051
	1		4615260051	4023560051	3195180051	3550200051
	2		4378580051	4615260051	2721820051	2958500051
23	0		2549040051	2500020051	1813740051	2696100051
	1		2843160051	2598060051	2058840051	2205900051
	2		2745120051	2892180051	1911780051	1911780051
34	0		1518640051	1296400051	7408000050	1481600051
	1		1592720051	1170480051	9630400050	1185280051
	2		1555680051	1679760051	8889600050	1000080051
63	0		5431800050	3785800050	3127400050	5596400050
	1		5267200050	4608800050	3950400050	4608800050
	2		6254800050	6584000050	3950400050	4444200050
90	0		2124000050-	3540000050-	3805500050-	2389500050-
	1		2301000050-	2035500050-	1858500050-	1416000050-
	2		1416000050-	1150500050-	2124000050-	1770000050-

Cond. 38		95		DELTA	PRESSURE	
PER CENT	CHORD	K	(120)K	PFR CFNT	R F F S	90+(120)K
TIME						
2	0		5672850051	4807500051	4903650051	5769000051
	1		6442050051	5576700051	4326750051	4903650051
	2		6634350051	7211250051	4711350051	4326750051
9	0		4593120051	4018980051	4146700051	4593120051
	1		5167260051	4593120051	3349150051	3923290051
	2		5071570051	5550020051	3444840051	3253460051
17	0		3263060051	2947280051	2842020051	3368320051
	1		3578840051	3052540051	2315720051	2526240051
	2		3368320051	3684100051	2420980051	2315720051
23	0		2062000051	1804250051	1752700051	2113550051
	1		2371300051	1958900051	1649600051	1855800051
	2		2319750051	2525950051	1598050051	1598050051
34	0					
	1					
	2					
63	0		4893000050	3215400050	3215400050	4333800050
	1		5452200050	4333800050	4194000050	5032800050
	2		6011400050	5731800050	3914400050	3774600050
90	0		8700000048	4350000049-	4785000049-	4350000048
	1		4350000048-	1305000049-	4350000049	4785000049
	2		3045000049	3915000049	8700000048	1740000049

		HARMONIC		ANALYSIS	
COFF	BLADE	LOADING	40	PFR CENT	RADIUS
STEADY		COSINF	SINF	MAX	PHI
1		9975966751			38100
2		7724630350	8495518350	1148231851	38101
3		1020831151	6165473150	1192571551	38102
4		1272890051	8766966749	1275905651	38103
5		3368551050	4417087550	5554979650	38104
		6258985049	7361296749	9662487249	38105

		HARMONIC		ANALYSIS	
COFF	BLADE	LOADING	55	PFR CENT	RADIUS
STEADY		COSINF	SINF	MAX	PHI
1		1665148452			38200
2		3051893350	1166927551	1206226551	38201
3		6998654250	1121723851	1122148251	38202
4		2109598251	6995086750	2222547451	38203
5		5050990050	2664900049	5058015150	38204
		4364903350	6574113149	4414131150	38205

		HARMONIC		ANALYSIS	
COFF	BLADE	LOADING	75	PFR CENT	RADIUS
STEADY		COSINF	SINF	MAX	PHI
1		2081746352			38300
2		1192064251	4627853350	1278744551	38301
3		1632113250	2916261750	3341912050	38302
4		3491850051	1230909351	3702452451	38303
5		1949044051	4012058350	1989909251	38304
		5672950050	3713482050	6891857750	38305

		HARMONIC		ANALYSIS	
COFF	BLADE	LOADING	85	PFR CENT	RADIUS
STEADY		COSINF	SINF	MAX	PHI
1		1926941752			38400
2		1814541751	2004448050	1825579351	38401
3		3190430050	1532540050	3539424150	38402
4		4435521551	1014443251	4550049051	38403
5		2083695551	6028046750	2169138251	38404
		6561295050	1681398350	7524494350	38405

		HARMONIC		ANALYSIS	
COFF	BLADE	LOADING	90	PFR CENT	RADIUS
STEADY		COSINF	SINF	MAX	PHI
1		2117461952			38500
2		2188715251	5382676050	2253931351	38501
3		1605456851	4282136750	1661581151	38502
4		4981235351	1616712851	5238930651	38503
5		2038449551	5040243350	2099837351	38504
		2547771750	4503241750	5174004950	38505

		HARMONIC		ANALYSIS	
COFF	BLADE	LOADING	95	PFR CENT	RADIUS
STEADY		COSINF	SINF	MAX	PHI
1		1611900252			38600
2		8691610050	2013300850	8921741150	38601
3		1908432551	2031481750	1919214451	38602
4		2500171251	1127859751	2741152451	38603
5		9622908350	1281318350	9708500350	38604
		4172431750	4729797550	6307152350	38605

		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	15	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		123273754				38210
1		3162770054	2570951153	3173202554	3553526953	38211
2		3642801354	8780086753	3753921854	1732369053	38212
3		1723516854	108333348	1723516854	1199999953	38213
4		1824901054	1756000853	1833330154	4362591852	38214
5		2109160754	9555021753	2317154154	6710764252	38215
		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	28	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1518308354				38220
1		3651334053	2472354552	3659694753	3561263653	38221
2		4563657253	7669174252	4677120253	4757673451	38222
3		1148224854	2060920253	1166573754	1166081653	38223
4		3385796053	1274862753	3617857153	5015825052	38224
5		5181162753	5366578253	7645227453	6281985552	38225
		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	36	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1200750054				38230
1		2160869253	1689982753	2743245753	1419715953	38231
2		4093750353	1418117353	4332418453	8044669652	38232
3		6550000053	1310003353	6679716253	1162300153	38233
4		8187463352	8508710052	1180816253	7847443252	38234
5		4591334752	6982481353	4008860353	5268470252	38235
		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	45	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		9999000053				38240
1		1951488053	2103351253	4476420853	2080260953	38241
2		7176001553	3346121553	7917882753	1025003253	38242
3		1588001253	2346002353	4286896353	1089404953	38243
4		2897995753	1195115653	3134757653	8459726352	38244
5		4190515553	5210649353	6686649853	4623860152	38245
		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	60	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		3482006754				38250
1		2699522353	4927981553	5618934353	2412863153	38251
2		5122263753	7790071553	7323239753	1183168053	38252
3		2748510253	4372669753	5164751553	1007174253	38253
4		2873460853	2596692853	3872930553	7947411752	38254
5		5296217353	2429308853	5826788153	3107193552	38255
		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	65	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4129616754				38260
1		2519467853	3741187853	4510455053	2360420853	38261
2		6480828253	6959581053	9509833353	1135200153	38262
3		2721945053	7128919753	7630889953	9696590652	38263
4		3240411253	3143039853	4514306653	7896847652	38264
5		4090987753	9055463553	9936679153	2286240652	38265
		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	80	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		3796604254				38270
1		1319053253	3264701053	3521104153	2479995853	38271
2		5979116253	1113565052	5980153153	8946651852	38272
3		2057327353	5271918253	5659127053	9710595452	38273
4		7072093352	1340721752	7821440152	5132129052	38274
5		1576218353	1187977554	1198388554	1648841852	38275
		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	92.5	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1478750054				38280
1		9018920052	1143871752	9091169452	1872782553	38281
2		2929162353	2605293553	3920146253	6917453052	38282
3		6333109252	7916671752	1013826953	1028865653	38283
4		7124990052	1782567753	1919688153	2794669652	38284
5		7435585052	4547716553	4608102053	1614284352	38285

## HARMONIC ANALYSIS

WH. BLADE	BEAM	REFD	15 D/O R				
COEF			COSINE	SINE	MAX	PHI	
STEADY			1104670855-				18410
1			3117720754-	1080860753-	3119593754	1819855653	18411
2			2816918254-	3168708153-	2834678754	1767914453	18412
3			2304751854-	2195010053-	2315180754	6181345552	18413
4			5121672253-	2534556753	5714499553	1841765652	18414
5			2040530854-	1095833154	2316164154	1035254552	18415

WH. BLADE	BEAM	REFD	2 D/O R				
COEF			COSINE	SINE	MAX	PHI	
STEADY			1272955054-				18420
1			3108854553-	7480043152-	3197575253	1935284853	18421
2			1467919253	2162378353	4086850153	1597254752	18422
3			9432735053-	1387165753	9534186953	5721137652	18423
4			4161494252	1201320553	1271358053	1772335152	18424
5			7433614853-	2135166353	7734181553	3279485752	18425

		HARMONIC		ANALYSIS		
RED BLADE	CHORD	BENDING	15	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4379375055				38110
1		2306326855	2739055054	2322534755	6772875151	38111
2		4491710053	2333918754	2376767754	1295532553	38112
3		4491662254	3144173254	5482777954	4833596752	38113
4		2695033754	3666666748	2695003754	1948833546	38114
5		1054093554	4051151753	1129261454	3179539152	38115
RED BLADE	CHORD	BENDING	28	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4313204255				38120
1		2169945255	4416273353	2170394555	1165923051	38121
2		1030454254	1784807354	2060915654	1499999553	38122
3		3532995754	2649756354	4416250354	4771000352	38123
4		1913711354	1784802254	2616832054	7924904852	38124
5		2267943554	4416260053	2310541354	3379619252	38125
RED BLADE	CHORD	BENDING	60	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2222153855				38130
1		8970784254	3727716753	8978525954	2379498051	38131
2		9978553353	9306458353	1364484154	1584780053	38132
3		7675633352	2666666748	7675633352	5999933952	38133
4		6908246753	9306426753	1159023154	5835328852	38134
5		4058248054	1754419754	4421240354	4067586052	38135
RED BLADE	CHORD	BENDING	80	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1552155055				38140
1		3099837054	1700985053	3104500454	3568591453	38141
2		5487396753	2715568353	6122567653	1668352053	38142
3		4703515053	3135648353	5652905753	1087700653	38143
4		4703493053	1357800053	4895554853	4097442152	38144
5		1923959254	8489915053	2102951654	4076211752	38145
WH. BLADE	CHORD	BEND	15 O/O R			
COEF		COSINE	SINE	MAX	PHI	
STEADY		3899793355				38430
1		2523534355	1373284554	2527268255	1831149253	38431
2		5467056753	3156350053	6312785053	1049997853	38432
3		5831470854	7289308353	5876852254	1176250053	38433
4		1822293053	3156336753	3644614253	6000006652	38434
5		1909485054	2635841354	3254810654	6118414752	38435
WH. BLADE	CHORD	BEND	28 O/O R			
COEF		COSINE	SINE	MAX	PHI	
STEADY		4043157555				38440
1		7003520855	6084830853	2004444655	1817395853	38441
2		7399449053	8312128353	8651527053	3694912052	38442
3		4559054254	2833333348	4559054254	1186927746	38443
4		1679654554	1662418854	2363234154	7882387352	38444
5		3238716554	2270911254	3955543354	6499255752	38445
		HARMONIC		ANALYSIS		
RED BLADE	TORSION	15 O/O R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		4581868354				38350
1		1369544053	2298202353	2675328953	2392084553	38351
2		6692606353	2675065553	7707423553	7910659352	38352
3		6177804553	1029636053	6263019953	6315411352	38353
4		2574085253	2675061053	3712393653	1152550952	38354
5		7547336353	1268556553	7653203353	1908219151	38355
RED BLADE	TORSION	50 O/O R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1375780054				38360
1		5705998352	9883096752	1141201253	2999999653	38361
2		5705981852	1294358352	6588704352	7499997052	38362
3		2282401553	2662801053	3507116553	7646623252	38363
4		1204599053	1098108152	1209593853	1302166951	38364
5		5705975052	9883071852	1141197953	1200001752	38365



		HARMONIC		ANALYSIS		
RED BLADE	PITCH	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		1341145152				38510
1		1668146351	3215008250	1698845251	1090882552	38511
2		1358802050	1344880050-	1911817250	1576475253	38512
3		3494113350	1747065050	3906541250	8855053651	38513
4		7764765049	3362066749-	8461386949	8414696652	38514
5		2067083349	8614615049	8859143649	1530138752	38515
RED BLADE	FLAP	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		2660000050-				38520
1		2553850051-	1353075751-	2890149451	2079154553	38521
2		1166666744	1228602550	1228602550	4499997452	38522
3		7093324549-	1666666743-	7093324549	6000000352	38523
4		1333333343	5000000043	6009252143	1407748352	38524
5		1521671749-	1826755850	1860392050	2018235652	38525
VERTICAL	ACCEL	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		9984775050				38530
1		2338400048	2437833348-	3378038848	3138073853	38531
2		2537643348-	6065208349	6070514649	4619791452	38532
3		1045103348	2232990049-	2253657249	9258848552	38533
4		2283743749-	1142711249-	2553678649	5164547552	38534
5		1288678349	7711985048-	1501811949	6582038952	38535
FORE-AFT	ACCEL	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		2754166749-				38540
1		8439050048-	1241352249	1501043349	1242089453	38541
2		1762668849	7250942349	7462115349	3816835252	38542
3		4406661848	8813323348	9853595148	2114498352	38543
4		1762667349	1144885049	2101846349	8251117751	38544
5		1064238849	1622980949	1940791449	1134918052	38545
LATERAL	ACCEL	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		6196666748				38550
1		1163861049	3339552248-	1210825549	3439898453	38551
2		3436333249	2439304849	4214094749	1768465152	38552
3		6759998748	1126663248	6853243948	3154098751	38553
4		2816670848-	8781498548	9222166748	2694592152	38554
5		1881389048	4466227048	4846319148	1343136852	38555
LIFT LINK	LOAD	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		5066974354				38610
1		2395026752	4030783352-	4688642352	3007181053	38611
2		6611078352	1308668353-	1466177453	1484009153	38612
3		2833401752	5666646752-	6135538752	9885522852	38613
4		9444183351-	1108663353-	1312066753	6646807852	38614
5		8938458352	7102515052-	1154221653	6415039552	38615
RIGHT	CYCLIC	LOAD	SINE	MAX	PHI	
COEF		COSINE				
STEADY		1733333351				38620
1		1801333052	9288866750	1803726452	2951935551	38621
2		6586666552	6004438751-	6613978352	1773956553	38622
3		1039999352	1386667352	1733333452	1771004452	38623
4		3466689551	1070755353	1071343853	2201371652	38624
5		1801332352-	1293776052	2217804052	2886257252	38625
LEFT	CYCLIC	LOAD	SINE	MAX	PHI	
COEF		COSINE				
STEADY		1504000052-				38630
1		4632503851-	4263745751	6296000251	1373736153	38631
2		8460002252-	1139689453-	1419369053	1167066153	38632
3		1879999552	3760018851	1917231252	3769997051	38633
4		1146799853-	2279379552	1169232953	4218960052	38634
5		831523351	1077627652	1365879152	1041773552	38635
COLLECTIVE	LOAD	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		2480000052				38640
1		2096343851	4516992751	4979747051	6510390652	38641
2		1983999552	5727311751-	2065012152	1719489553	38642
3		1983999852	3306670851	2011366752	3154111551	38643
4		9919990351-	2290926052	2496478352	2835330352	38644
5		7823667351	1210325251-	7916732751	7024120652	38645
STABILIZER	BAR	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		1464833350-				38650
1		2078718550	2190732051	2200572151	8457960652	38651
2		8616633348-	1492452049-	1723333049	1200000653	38652
3		1034002750-	8616685049-	1345969650	7326852052	38653
4		4308352249	1492469249-	4559535449	8522331352	38654
5		1071313348-	1013014250	1013070950	1812118352	38655

## HARMONIC ANALYSIS

	R F	PYLON	POSITION COSINE	SINE	MAX	PHI	
COFF			4179166749				38310
STEADY			6733943248	9174675047	6796156148	1722415053	38311
1			3712083749	1277386748	3714280849	9098543552	38312
2			9833416747	5833386747	1390653048	1499997152	38313
3			3195837848	7238525248	7912624548	7345541352	38314
4			1624380248	6587283346	1625715348	3553555752	38315
5							

	R A	PYLON	POSITION COSINE	SINE	MAX	PHI	
COFF			7650000049				38320
STEADY			7178208048	6897123348	9954746648	1361440553	38321
1			7250001748	3247595749	3327537149	5129224252	38322
2			5000007548	7000005048	5830960948	1032125452	38323
3			2249990048	4330196747	2291279348	4227659852	38324
4			6678223848	8971096747	6738210448	7046981052	38325
5							

	L F	PYLON	POSITION COSINE	SINE	MAX	PHI	
COFF			1450000049				38330
STEADY			9446155548	3433011748	1005064349	3400273653	38331
1			2524999249	2554775249	3492004649	1573320853	38332
2			1000001048	3833333342	1000001048	5999992952	38333
3			1249999048	1299040048	1802776348	1152554552	38334
4			7461560047	2566990348	2735008948	4995336752	38335
5							

	L A	PYLON	POSITION COSINE	SINE	MAX	PHI	
COFF			4600416749				38340
STEADY			4116524548	5605032748	6954291248	5370518552	38341
1			4015832749	8804591748	4111218849	6183129751	38342
2			5083323347	1049997848	3092068648	9315410352	38343
3			7116665348	2641381748	7491035648	3990934452	38344
4			1475150348	4080023548	4338509048	5797553752	38345
5							

	RED	PITCH LINE	COSINE	SINE	MAX	PHI	
COFF			1901083352				38370
STEADY			4223024852	4562818852	6217174052	2272148253	38371
1			6498330852	2411879852	6931483852	7981870552	38372
2			1067583553	1067583553	1509791053	7499999852	38373
3			2320829852	4823763252	5353031152	7392333652	38374
4			1811146852	5430176251	1890799052	3933795452	38375
5							

	WHITE	PITCH LINE	COSINE	SINE	MAX	PHI	
COFF			1871100053				38380
STEADY			8417780051	7385327752	7433145752	8749750152	38381
1			3401997352	8417761751	3504593152	9694894652	38382
2			8747998552	8261996752	1203279153	1445447352	38383
3			4859988351	6417790051	7720014151	7499997052	38384
4			8417785051	2334670852	2481789452	2196541152	38385
5							

IBM TAB NO. 14b  
MANEUVER CONDITION NO. 38 - APPROACH AND FLARE  
REVOLUTION 2

Cond. 18		40		DELTA PER CENT	PRESSURE RADIUS
PER CENT CHORD	K	(120)K	D E G 30+(120)K	R E E S 60+(120)K	90+(120)K
TIME	97				
4	0	3193190051	3017740051	2526480051	2105400051
	1	2351030051	2491390051	2526480051	2596660051
	2	2912470051	1473780051	1684320051	2035220051
17	0	1618020051	1436220051	1199880051	1054440051
	1	1254420051	1345320051	1236240051	1199880051
	2	1363500051	6726600050	9453600050	1145340051
34	0	7440000050	6960000050	6000000050	4920000050
	1	5880000050	6000000050	5640000050	6120000050
	2	7320000050	3600000050	4440000050	5040000050
63	0	3380300050	2809600050	2634000050	2370600050
	1	2721800050	2677900050	2897400050	2809600050
	2	3555900050	1624300050	2151100050	2370600050
88	0	1390500050	9888000049	9270000049	8652000049
	1	1112400050	1143300050	1205100050	1266900050
	2	1606800050	6798000049	1081500050	1143300050

		55		DELTA PER CENT	PRESSURE RADIUS
PER CENT CHORD	K	(120)K	D E G 30+(120)K	R E E S 60+(120)K	90+(120)K
TIME	97				
2	0	5760000051	5253120051	4055040051	3087360051
	1	4193280051	4177600051	3962880051	4055040051
	2	5253120051	2718720051	3502080051	4008960051
9	0	3363300051	3045150051	2317950051	1954350051
	1	2454300051	2499750051	2227050051	2408850051
	2	3090600051	1590750051	1999800051	2317950051
17	0	2456300051	2315940051	1929950051	1614140051
	1	1965040051	2035220051	1789590051	1929950051
	2	2315940051	1333420051	1614140051	1789590051
23	0	1920240051	1706880051	1457960051	1315720051
	1	1564640051	1529080051	1351280051	1457960051
	2	1706880051	1031240051	1280160051	1351280051
34	0	1768800051	1636800051	1399200051	1359600051
	1	1491600051	1465700051	1320000051	1425600051
	2	1663200051	1108800051	1267200051	1372800051
63	0	5779400050	4965400050	4314200050	3907200050
	1	4619800050	4395600050	4110700050	4639800050
	2	5209600050	3500200050	3907200050	4232800050
90	0	2189400050	1655400050	1655400050	1441800050
	1	1735500050	1682100050	1628700050	1762200050
	2	1762200050	1161700050	1521900050	1655400050

		75		DELTA PER CENT	PRESSURE RADIUS
PER CENT CHORD	K	(120)K	D E G 30+(120)K	R E E S 60+(120)K	90+(120)K
TIME	97				
2	0	7641540051	7075500051	4198130051	7217010051
	1	6792480051	6273610051	5471720051	6084930051
	2	7028330051	6792480051	4575490051	5896250051
9	0	4703070051	4237000051	2754050051	4575960051
	1	4152260051	3855670051	3728560051	3770930051
	2	4364110051	4025150051	2965900051	3516710051
17	0	2954640051	2698950051	1392090051	2670540051
	1	2613720051	2272800051	1931880051	2187570051
	2	2642130051	2642130051	1534140051	2130750051
23	0	2927830051	2720550051	1684150051	2746460051
	1	2668730051	2331900051	2020980051	2228260051
	2	2668730051	2539180051	1710060051	2202350051
34	0	1818240051	1647780051	8238900050	1761420051
	1	1619370051	1477320051	1250040051	1392090051
	2	1619370051	1562550051	9659400050	1363680051
63	0	8397100050	7051000050	4935700050	7820200050
	1	7179200050	6474100050	5897200050	7243300050
	2	7435600050	7884300050	4871600050	6666400050
90	0	3905000050	3514500050	2804500050	3976000050
	1	3656500050	3408000050	3266000050	3727500050
	2	3869500050	3940500050	2875500050	3479000050

COND. 08		85		DELTA PFR CFMT		PRESSURE RADIUS	
PER CFMT CHORD	K	(120)K	D E G 30+(120)K	R E E S 60+(120)K	90+(120)K		
TIME	97						
2	0	8381990051	7386110051	2987640051	8796940051		
	1	7386110051	7137140051	6058270051	6805180051		
	2	8464980051	9792820051	3900530051	6639200051		
4	0	7644540051	7022310051	2755590051	8977890051		
	1	7022310051	6488970051	5422290051	6133410051		
	2	7466760051	9155670051	3466710051	5955630051		
9	0	5616180051	5205240051	2054700051	6369570051		
	1	5136750051	4794300051	3972420051	4451850051		
	2	5205240051	6095610051	2534130051	4314870051		
13	0	3981800051	3518800051	1157500051	4722600051		
	1	3750300051	3333600051	2824300051	3194700051		
	2	3935500051	4676300051	1666800051	3055800051		
17	0	3431400051	3039240051	7843200050	4117680051		
	1	3333360051	2941200051	2451000051	2745120051		
	2	3235320051	4019640051	1470600051	2647080051		
23	0	3004410051	2719320051	1403520051	3355290051		
	1	2850900051	2631600051	2280720051	2521950051		
	2	2960550051	3311430051	1622820051	2434230051		
34	0	1926750051	1633150051	7890500050	2110250051		
	1	1871700051	1669850051	1523050051	1761600051		
	2	2036850051	2146950051	1009250051	1614800051		
47.7	0						
	1						
	2						
63	0	7711200050	5902400050	2189600050	7616000050		
	1	6568800050	5807200050	5236000050	6568800050		
	2	8187200050	9520000050	4093600050	6092800050		
77	0	2844000050	1327200050	6636000049	2749200050		
	1	1990800050	1516800050	1611600050	2559600050		
	2	3412800050	4266000050	9480000049	2085600050		
90	0	1886000049	1414500050	1886000050	5658000049		
	1	6601000049	8487000049	1037300050	2829000049		
	2	1886000049	8487000049	8487000049	2829000049		

CONC. OF		90		DELTA	PRESSURE	
PER CENT		(120)K		PER CENT	RADIUS	
CHORD						
TIME	97					
	0	8888880051	7619040051	3386240051	9629620051	
	1	8359780051	7830680051	6666660051	7513220051	
	2	9417980051	1058200052	3915340051	7195760051	
	0	5253690051	4516330051	1935570051	6451900051	
	1	5253690051	4608500051	3778970051	4331990051	
	2	4885010051	5622370051	2304250051	3963310051	
	0	4615260051	4141900051	2130120051	5206960051	
	1	4496920051	4141900051	3431860051	3905220051	
	2	4851940051	5561980051	2248460051	3668540051	
	0	3137880051	2843160051	1519620051	3431400051	
	1	2843160051	2647080051	2156880051	2451000051	
	2	3137880051	3631400051	1666680051	2352960051	
	0	1777920051	1481600051	5926400050	2000160051	
	1	1555680051	1296400051	1148240051	1333440051	
	2	1852000051	2074240051	8519200050	1259360051	
	0	6748600050	4773400050	2798200050	6419400050	
	1	5267200050	4773400050	4279600050	5431800050	
	2	7242400050	8888400050	3785800050	5267200050	
	0	1327500050-	3186000050-	3805500050-	2301000050-	
	1	1770000050-	2189500050-	1593000050-	9735000049-	
	2	1770000049-	6195000049	1770000050-	1327500050-	

CONC. OF		95		DELTA	PRESSURE	
PER CENT		(120)K		PER CENT	RADIUS	
CHORD						
TIME	97					
	0	6922800051	5384400051	3846000051	7115100051	
	1	6634350051	5961300051	4903650051	5576700051	
	2	7788150051	8461200051	5095950051	5672850051	
	0	5550020051	4593120051	317770051	5837090051	
	1	5262950051	4688810051	3827600051	4306050051	
	2	6028470051	6124160051	3731910051	4497430051	
	0	3894620051	3168320051	2315720051	3789360051	
	1	3578840051	3263040051	2526240051	2947280051	
	2	3894620051	4315660051	2736760051	3052540051	
	0	2427850051	2010450051	1443400051	2629050051	
	1	2119750051	2010450051	1752700051	2010450051	
	2	2732150051	3041440051	1701150051	2010450051	
	0					
	1					
	2					
	0	5172600050	3495000050	2656200050	5172600050	
	1	4753200050	4753200050	4753200050	5452200050	
	2	6710400050	7129800050	4194000050	4753200050	
	0		5655000049-	3915000049-	4350000048-	
	1	4350000048-	2610000049	2610000049	4785000049	
	2	4350000049	5655000049	1740000049	1740000049	

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	40	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
		9140201751				97038100
1		1947248349	6670523250	6633381950	8831702452	97038101
2		1450329551	1051796851	1791572551	1797504352	97038102
3		1121607251	3699770049	1122217251	6297640450	97038103
4		4246776050-	2369316250-	4862999650	5228939157	97038104
5		1044318350	5833477550	5926218150	1597006852	97038105

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	55	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
		1634634052				97038200
1		7443090050	5954403350	9531763150	3865948752	97038201
2		1936560851	1164003251	2259462651	1550434952	97038202
3		2106611551	3384456750	2133625451	3042359151	97038203
4		8247480550-	2085960050-	8507183150	4854841252	97038204
5		2430661750	8601851750	8938678350	1484421552	97038205

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	75	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
		2231885852				97038300
1		1135300049-	3627338350	3629114550	9179268752	97038301
2		2467578350	4505713350	5137158350	3064622452	97038302
3		4354121351	3749643350	4370236851	1640667851	97038303
4		2127781251	5917573350	2208535651	3885446051	97038304
5		4887135050-	8767170050	1003729851	2382737452	97038305

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	85	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
		2157498452				97038400
1		1214080551-	8166223350-	1463169051	2139258253	97038401
2		1139428051-	2510550049	1139706651	8936889252	97038402
3		6070685051	5717280050	6097547851	1793387151	97038403
4		4270977551	4826035050	4298157251	1611712751	97038404
5		1142804251-	7883630050	1388350751	2908003352	97038405

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	90	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
		2382004852				97038500
1		1429912051-	1156563051-	1839099351	2189671553	97038501
2		1838956251-	2813916750	1860360551	8565012752	97038502
3		6834713751	7061131750	6871092151	1966153051	97038503
4		4753938851	1944328350	4757913251	5855132050	97038504
5		1072833251-	6524216750	1255637351	2973899652	97038505

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	95	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
		1792446852				97038600
1		5344710050-	1509319551-	1601157351	2505002453	97038601
2		1709524851-	1199700050-	1713729251	9200714552	97038602
3		1577841051	5666376750	3622435551	2999807551	97038603
4		2086815751	2143315050-	2097793651	8853396652	97038604
5		1910253350-	4116171750	4537834050	2297906252	97038605

		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	15	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		6903366754-				97038210
1		3466920054	1156941054-	3654866254	3415457153	97038211
2		2027667354	7024042353	2145881354	9553299051	97038212
3		2027666354	1016666748-	2027666354	1199999953	97038213
4		1419365754	3512028853-	1462170554	8652552052	97038214
5		2413310254	4317760054-	4946424754	5984039452	97038215
RED BLADE	BEAM	BENDING	28	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		8317083353-				97038220
1		1008905854	5268551553-	1138186054	3324262453	97038221
2		3532995053	3569612253-	5022368553	1573523153	97038222
3		1059500354	5888300052	1061534654	1059937151	97038223
4		1177671553-	1529835053-	1930623053	5810270552	97038224
5		1110892954	2770611254-	2985024254	5836972152	97038225
RED BLADE	BEAM	BENDING	36	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1577375054-				97038230
1		4608516253	3696554253-	5907870653	3212664253	97038231
2		6549965252	2268986553-	2361635053	1430510253	97038232
3		7860001753	9824961052	7921169553	2374995651	97038233
4		3275003853-	1134491753	3465937253	4022336152	97038234
5		9146472853	2184844254-	2368570054	5854315552	97038235
RED BLADE	BEAM	BENDING	45	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1317300054-				97038240
1		3819782252	4198120753-	4215462553	2751989153	97038241
2		4623002753-	1075602953-	4746480453	9654880952	97038242
3		6624001053	2622003053-	7124064153	1128015653	97038243
4		3243004353-	1553649253	3595956553	3860049852	97038244
5		8600155552	1208587754-	1211643754	5481404852	97038245
		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	60	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2819860054-				97038250
1		721386281-	6433426353-	9665856953	2217270453	97038251
2		1393006154-	5085185053-	1482921854	1000273453	97038252
3		1124396753	2498666853-	2740000753	9807589752	97038253
4		2061401853-	2272103353	3067870753	3305409852	97038254
5		1002693654-	1780235254	2043191654	2387796252	97038255
RED BLADE	BEAM	BENDING	65	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		3261185054-				97038260
1		9074419753-	7620959053-	1185006854	2200245253	97038261
2		1535956854-	5949320053-	1647151354	1005866053	97038262
3		1296111052	4536582353-	4538433453	9054550152	97038263
4		4860626353-	3367533352	4872277853	4400919552	97038264
5		1244194554-	2874846754	3132533154	2268046152	97038265
RED BLADE	BEAM	BENDING	80	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4047341754-				97038270
1		3419731853	5944590353-	6858040553	2999104453	97038271
2		1298590354-	8017665053-	1526245754	1058448853	97038272
3		6043426753-	2700245553-	6619239553	6802514252	97038273
4		9000830253-	6681371752	9025594253	4393867352	97038274
5		9720306753-	4104782554	4218303354	2066449952	97038275
RED BLADE	BEAM	BENDING	92.5	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2096250054-				97038280
1		4098089353	9480726752-	4206326053	3469740653	97038281
2		3166659253-	4113621753-	5191301753	1162055053	97038282
3		4591672353-	9499978352-	4688917953	6189644352	97038283
4		5224997853-	1000000047-	5224997853	4500000452	97038284
5		3306419753-	1852306554	1881585454	2002417452	97038285



## HARMONIC ANALYSIS

WH. BLADE BEAM BEND	15 O/O R COSINE	SINE	MAX	PHI	
COEF	8632208354-				97038410
STEADY	3300989854-	2917984353	3313861854	1749483453	97038411
1	1664543854	7920523353	1843380954	1272342952	97038412
2	3292501754-	3292505053-	3308923254	6190353552	97038413
3	4207082253	3168283352-	4218995353	8892332052	97038414
4	3174260554-	4537198754	5537337154	2499538952	97038415
5					

WH. BLADE BEAM BEND	2 O/O R COSINE	SINE	MAX	PHI	
COEF	2048366753-				97038420
STEADY	8092696553-	5728312552	8112944853	1759511553	97038421
1	4438935553	4805287853-	6541784153	1563652753	97038422
2	1387167054-	5548692252	1388276354	5923646352	97038423
3	3606631553-	4805286052-	3638502353	4689727552	97038424
4	1049533054-	2411873254	2630333054	2270328052	97038425
5					

		HARMONIC		ANALYSIS		
RED BLADE	CHORD	BENDING	15	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4132133355				97038110
1		3422793355	5369551854-	3464655155	3510843253	97038111
2		2000000048-	7779785053	7779785053	4500007752	97038112
3		7635829354-	1347508254	7753816354	5666398752	97038113
4		4491690053	4666666748	4491690053	1488194347	97038114
5		2337095354-	9412057254	9697877954	2078900152	97038115
RED BLADE	CHORD	BENDING	28	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4224875255				97038120
1		2837100555	4068987354-	2866130855	3518382653	97038121
2		2208122054	2549760053-	2222794554	1767065653	97038122
3		3827413054-	1177674354	4004498354	5429905252	97038123
4		1619288554-	1784811054	2409905754	3305405652	97038124
5		6958320053-	6129906854	6169273854	1929523452	97038125
RED BLADE	CHORD	BENDING	60	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2283560455				97038130
1		9708993054	1435083754-	9814479654	3515920153	97038131
2		2648159554	5982726753-	2714899454	1736347253	97038132
3		6140688353	1611928254	1724932754	2307850552	97038133
4		9594775053-	7312233353	1206351854	3567219252	97038134
5		2695931753	6373886753-	6920583853	5858533652	97038135
RED BLADE	CHORD	BENDING	80	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1524717955				97038140
1		2113006754	2848718253-	2132123254	3523217853	97038141
2		7839148353	1357783353-	7955867153	1750867853	97038142
3		9407015053	1175876754	1505857054	1711339652	97038143
4		7839050052-	5431148353	5487429253	2455326952	97038144
5		4667793353-	4206513253-	6283553753	4440489852	97038145
WH. BLADE	CHORD BEND	15 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		4100250055				97038430
1		3197446755-	4415425254	3227789555	1721376353	97038431
2		2733509254-	2840733854-	3942314254	1130510053	97038432
3		6560405054	1822132254-	6808807854	1148253053	97038433
4		2733495354	3156406753	2751658754	4335328752	97038434
5		4639476554	1389155053-	1464581555	5769364252	97038435
WH. BLADE	CHORD BEND	28 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		4235117555				97038440
1		2515967755-	3626786254	2541973555	1717972853	97038441
2		1559682554-	1039011854-	1874074454	1068351653	97038442
3		4559054554	3359297854-	5663025754	1078719053	97038443
4		5998705053-	6234050053-	8651464753	5652554352	97038444
5		4763935254	8425779554-	9679299554	5989676252	97038445
		HARMONIC		ANALYSIS		
RED BLADE	TORSION	15 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		4427423354-				97038350
1		1406506853-	1406512053-	1989104753	2250001153	97038351
2		7207423753-	3566754353	8041684653	7683524052	97038352
3		8237071253-	4118536053-	9209325853	6885502052	97038353
4		4118534253	5350127253	6751754253	1310272052	97038354
5		3768658352	3768661752	5329690052	9000005151	97038355
RED BLADE	TORSION	50 0/0 R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1477220054-				97038360
1		1022284353-	1847705753-	2111653853	2410454753	97038361
2		9509982352-	1098116752	9573172052	8670662152	97038362
3		2916401253-	1268001353-	3180129453	6783286452	97038363
4		6340095051-	1098105052	1267991652	3000018152	97038364
5		5150798352	3604697253-	3641311453	5562640452	97038365

		HARMONIC		ANALYSIS	
RED BLADE COEF	PITCH	POSITION COSINE	SINE	MAX	PHI
STEADY		1461497452			
1		1992246751	6901327850-	2108395251	3408934451
2		2911553349	2857871750-	2872664650	1379085753
3		3105883350	5823666749	3160009850	3539965551
4		9707016748	5043466749	5136031349	1977641752
5		1430393350	4955038349	1513786350	3821328851
97038510					
97038511					
97038512					
97038513					
97038514					
97038515					
RED BLADE COEF	FLAP	POSITION COSINE	SINE	MAX	PHI
STEADY		3546666750-			
1		2208220751-	2055577051-	3016891751	2229496953
2		8866658049-	3071493349-	9383586549	9955328652
3		1418665450-	1418665850-	2006296150	7500000452
4		7093341749-	1166666744	7093341749	4499997852
5		1503128550-	3709102750	4002104250	2241209052
97038520					
97038521					
97038522					
97038523					
97038524					
97038525					
VERTICAL COEF	ACCEL	COSINE	SINE	MAX	PHI
STEADY		1049227551			
1		1464460749	2709796748-	1489320349	3495167353
2		6597633348-	6065210049	6100988449	4810406752
3		1826988749-	1725490049-	2513006849	7445448052
4		6597445048-	1494317249-	1633476949	6154461252
5		5805600047	1150001049-	1151465549	5457800752
97038530					
97038531					
97038532					
97038533					
97038534					
97038535					
FORE- AFT COEF	ACCEL	COSINE	SINE	MAX	PHI
STEADY		5949000049-			
1		6634503549	3413040548	6643276749	2944916451
2		1101663249-	1125804250	1131181550	4779446452
3		4516832549-	7711656748	4582190749	3229592052
4		1652499049-	3434656349	3811511149	2892334452
5		3390662749	2311370048-	3398531749	7122005352
97038540					
97038541					
97038542					
97038543					
97038544					
97038545					
LATERAL COEF	ACCEL	COSINE	SINE	MAX	PHI
STEADY		1802666749			
1		1400244749	2706173848	1426155349	1093837652
2		5238998849	1853871549	5557332849	9743415051
3		1126666349	4506663348	1213456749	7267133751
4		3323667349-	1658728049	3714585249	3836945052
5		1609109848-	8560515848	8710434348	2012912152
97038550					
97038551					
97038552					
97038553					
97038554					
97038555					
LIFT LINK COEF	LOAD	COSINE	SINE	MAX	PHI
STEADY		5189752854			
1		4527911752	7268568352-	8563531352	3019206053
2		2313895553	8997095052	2482657853	1062376152
3		5666646752-	4722200052-	7376317452	7326851452
4		1652789853	2699123353-	3164961553	7537023852
5		1019452053-	2546401752	1050773053	3319511052
97038610					
97038611					
97038612					
97038613					
97038614					
97038615					
RIGHT COEF	CYCLIC	LOAD COSINE	SINE	MAX	PHI
STEADY					
1		9471104551-	2240888052	2432816752	1129113453
2		7626666852	1801333352	7836507452	6644541851
3		6933329051	1666666745-	6933329051	1200000053
4		4160002852	1140844153	1214323553	1749149852
5		2537779051	1608902551-	3004811151	6552521952
97038620					
97038621					
97038622					
97038623					
97038624					
97038625					
LEFT COEF	CYCLIC	LOAD COSINE	SINE	MAX	PHI
STEADY					
1		5264000052-			
2		3746501352-	2104876552	4297298852	1506716653
3		9588001752-	8791889852-	1300873253	1112599153
4		3759995351	1127999852-	1189016152	9614497752
5		8836000352-	1628127752-	8984748252	4761006652
97038630					
97038631					
97038632					
97038633					
97038634					
97038635					
COLLECTIVE COEF	LOAD	COSINE	SINE	MAX	PHI
STEADY		8266666751-			
1		5403009551	1210323551	5536912051	1262633652
2		9920001051	1145463052	1515305152	2455330252
3		1322666752	3306670851-	1363373752	1153212453
4		1322666552	5727313351	1441342452	5853305451
5		1113032152	4516989251-	1201196252	6758226952
97038640					
97038641					
97038642					
97038643					
97038644					
97038645					
STABILIZER COEF	BAR	COSINE	SINE	MAX	PHI
STEADY		1378666750-			
1		2101807550	2812656351	2820498451	8572641652
2		1723330749-	1666666743	1723330749	8999997652
3		8616700049-	5170023349-	1004871450	7032125952
4		1723303349-	2333333344-	1723303349	4500019452
5		3108661749	1859437250	1885243950	1610177952
97038650					
97038651					
97038652					
97038653					
97038654					
97038655					

## HARMONIC ANALYSIS

R F	PYLON	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		3146666749				97038310
1		3555761748-	1540874548	3875272248	1565707153	97038311
2		4252916349-	1405126349	4479026349	8085845252	97038312
3		4916590047-	4916635847-	6953140747	7500009052	97038313
4		4670836748	8941709748-	1008815649	7439524752	97038314
5		1852563748-	2392465548	3025869048	2555035852	97038315

R A	PYLON	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		9650000049				97038320
1		8214105048-	3299052848	8851851248	1581180053	97018321
2		3250008548-	2901185349	2915332449	4819591552	97038322
3		9999893347-	1000005048	1414209648	4499985452	97038323
4		4249996848-	1342338449-	1408011849	6310790452	97038324
5		1285879348-	7009726747	1464530148	3028076752	97038325

L F	PYLON	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		4500000048				97038330
1		1092820549	8660263347-	1096246649	3554689653	97038331
2		3149999249	2251666249-	3872014549	1622211353	97038332
3		9999961747	5999997248-	6082759148	9315409852	97038333
4		7499999748	8660255248	1145644049	1227665252	97038334
5		2928205348-	8660186747	3053583948	3270487752	97038335

L A	PYLON	POSITION	SINE	MAX	PHI	
COEF		COSINE				
STEADY		7091250049				97038340
1		3490232848	2932032248-	4558348248	3199674653	97038341
2		5566248549	5722983348	5595591749	2935142551	97038342
3		1524997848-	3049996748-	3409999748	8114498852	97038343
4		3812502348-	4842518848-	6163210448	5794668352	97038344
5		2609776748	4692954748-	5169800648	5981573452	97038345

RED	PITCH LINK	COSINE	SINE	MAX	PHI	
COEF						
STEADY		1926291753-				97038370
1		6929175552-	5909795352-	9107093652	2204603953	97038371
2		8819164052-	8039598351	8855732952	8739564252	97038372
3		1067583553-	1021166853-	1477334153	7457566052	97038373
4		4641649051	2411881852-	2456139852	7022334152	97038374
5		4974968351-	4301875752-	4330547152	5268065152	97038375

WHITE	PITCH LINK	COSINE	SINE	MAX	PHI	
COEF						
STEADY		1822500053-				97038380
1		5554107752	7224885752	9113017352	5244883252	97038381
2		2186996552-	1262665252-	2525327152	1050000253	97038382
3		8747997552	9233997552	1271983453	1551605252	97038383
4		2187001052-	2104443852-	3035071252	5597447652	97038384
5		1180107052-	6383112752	6491285052	2009491052	97038385

IBM TAB NO. 14c

MANEUVER CONDITION NO. 38 - APPROACH AND FLARE

REVOLUTION 3

TIME	PER CENT CHORD	Y	DELTA PER CENT		PRESSURE RADIUS	
			11201K	30*11201K	60*11201K	90*11201K
4		0	2526480051	3087920051	2561570051	2421210051
		1	1929950051	1508870051	2631750051	1438690051
		2	1368510051	1649230051	1824680051	2315760051
17		0	1199860051	1472580051	1199880051	1108980051
		1	9451600050	8362800050	1254470051	7453800050
		2	6363000050	7817400050	9635400050	1236240051
34		0	6600000050	7080000050	5880000050	5040000050
		1	4440000050	3960000050	6460000050	4320000050
		2	3120000050	4200000050	4580000050	5520000050
61		0	3160800050	3073000050	2414500050	2326700050
		1	1799900050	1931600050	2897400050	2107200050
		2	1799000050	1887700050	2061300050	2502300050
90		0	1266900050	1421400050	8652000049	8652000049
		1	7107000049	4579000049	1297800050	8961000049
		2	7721000049	8343000049	8652000049	1174200050

TIME	PER CENT CHORD	Y	DELTA PER CENT		PRESSURE RADIUS	
			11201K	30*11201K	60*11201K	90*11201K
2		0	5529600051	5391360051	4239360051	1640320051
		1	2257920051	4746240051	4608000051	5022720051
		2	3271680051	2764800051	4594240051	4239360051
9		0	1090600051	3045150051	2408850051	2227050051
		1	1499850051	2772450051	2727000051	2908800051
		2	1954350051	1545300051	2090700051	2454300051
17		0	2315940051	2421210051	1965040051	1754500051
		1	1333420051	2175580051	2035220051	2245760051
		2	1614140051	1368510051	1649230051	1894860051
23		0	1849120051	1778000051	1422490051	1315720051
		1	1102360051	1671320051	1600300051	1706880051
		2	1209040051	9956800050	1280160051	1493520051
34		0	1702800051	1663200051	1452000051	1306800051
		1	1214400051	1497200051	1504800051	1623600051
		2	1254000051	1108800051	1293600051	1412400051
61		0	5494500050	5128200050	4477000050	3581600050
		1	3627300050	5168900050	4924700050	5372400050
		2	4070000050	3378160050	3866500050	4477000050
90		0	2002500050	1762200050	1682100050	1308300050
		1	1521920050	2062500050	1708800050	2002500050
		2	1602000050	1335000050	1548600050	1655400050

TIME	PER CENT CHORD	Y	DELTA PER CENT		PRESSURE RADIUS	
			11201K	30*11201K	60*11201K	90*11201K
2		0	7783050051	7075500051	4339640051	7217010051
		1	6745110051	6933990051	5225440051	5273610051
		2	5698140051	4764170051	4952850051	4611220051
9		0	4787810051	4129840051	2881180051	4575960051
		1	4121740051	4109890051	3171100051	3709300051
		2	4152740051	2965900051	3008270051	3709300051
17		0	3068780051	2727360051	1477320051	2562920051
		1	2613720051	2613720051	2244390051	2354300051
		2	2670540051	1761420051	1676130051	1864400051
23		0	3005560051	2720550051	1787720051	2668710051
		1	2668730051	2642820051	2331900051	2331900051
		2	2615910051	1865520051	1865520051	2409630051
34		0	1931880051	1676190051	8523000050	1733010051
		1	1590960051	1647780051	1429500051	1477320051
		2	1642780051	1051170051	1221630051	1477320051
61		0	8845800050	5922800050	5256700050	7179200050
		1	7499700050	7543800050	6410000050	7435600050
		2	7621900050	5474100050	5256700050	6922800050
90		0	4118000051	3514500050	2911000050	4189000050
		1	3727500050	3976000050	3408000050	3692000050
		2	3763000050	3514500050	3017500050	3514500050

TIME	PER CENT CHORE	F	DELTA PER CENT		PRESSURE RADIUS	
			R		R	
			(120)K	10+(120)K	60+(120)K	90+(120)K
195						
	2	0	8962920051	7635080051	3485580051	9626840051
		1	8630960051	7884050051	7469120051	7552090051
		2	9294880051	9626840051	4481460051	7801060051
	4	0	8266770051	7200090051	3200040051	9689010051
		1	8444550051	7377870051	6844530051	6755640051
		2	8266770051	8622330051	3911160051	7022310051
	6	0	5821650051	5342220051	2534130051	7739370051
		1	5821650051	5342220051	4862790051	4794300051
		2	5684670051	5684670051	2945070051	4931280051
	13	0	4120700051	3518800051	1481600051	5761220051
		1	4120700051	3796600051	3518800051	3518800051
		2	4305900051	4305900051	1990200051	3611400051
	17	0	3225520051	3137280051	1275520051	4509840051
		1	3225520051	3439440051	3225520051	3079240051
		2	3627480051	3627480051	1666680051	3079240051
	23	0	3114060051	2741250051	1644750051	3684240051
		1	3026340051	2872830051	2653530051	2675460051
		2	3092130051	3070200051	1864050051	2719220051
	34	0	2110250051	1614800051	2358500050	2368800051
		1	1963450051	1945100051	1945100051	2000150051
		2	2091900051	2128600051	1119350051	1743250051
	47.7	0				
		1				
		2				
	63	0	7996800050	5997600050	3236800050	8282400050
		1	5949600050	6759200050	5092800050	6759200050
		2	6472800050	4763200050	5045600050	6759200050
	77	0	3128400050	1227400050	1896000049	3223200050
		1	1896000050	2985600050	1990800050	2464800050
		2	4602400050	3192000050	1422000050	2275200050
	90	0	1886000049	1037300050	1603100050	3772000049
		1	2544000049	8487000049	1508800050	1037300050
		2	2829000049	5658000049	6601000049	2430000048

TIME		90		DELTA PER CENT	PRESSURE RADIUS
PER CENT CHORD	K	(120)K	D F G 30+(120)K	R F F S 60+(120)K	90+(120)K
195					
2	0	9206340051	7936500051	4973540051	1076454052
	1	8994700051	8148140051	8359780051	8359780051
	2	9947080051	1089946052	5291000051	8783060051
9	0	4792840051	4792840051	2765100051	7650110051
	1	5438030051	4885010051	4977180051	4977180051
	2	5161520051	7097090051	3133780051	4885010051
17	0	4615260051	4260240051	2840160051	6863720051
	1	5088620051	4496720051	4260240051	4260240051
	2	5206960051	5798660051	3195180051	4378580051
23	0	3235320051	2892180051	2058840051	3725520051
	1	3088260051	2843160051	2647080051	2696100051
	2	3235320051	3725420051	2352960051	2892180051
34	0	1214960051	1481600051	9260000050	2185360051
	1	1666800051	1555680051	1518640051	1481600051
	2	2000160051	2222400051	1333440051	1518640051
63	0	7242400050	5102600050	4115000050	7077800050
	1	5761000050	5596400050	5102600050	5925600050
	2	7736200050	9053007050	5925600050	6254800050
90	0	9735000049	2832000050	3097500050	2124000050
	1	1947000050	1593000050	1239000050	1416000050
	2	1770000049	7080000049	8850000048	1062000050

TIME		95		DELTA PER CENT	PRESSURE RADIUS
PER CENT CHORD	K	(120)K	D F G 30+(120)K	R F F S 60+(120)K	90+(120)K
195					
2	0	6922800051	5480550051	6057450051	8076600051
	1	6922800051	6442050051	6442050051	6538200051
	2	8076600051	9422700051	7788150051	7115100051
9	0	5454330051	4784500051	4784500051	7176750051
	1	5454330051	5071510051	4975880051	4975880051
	2	6028470051	7549510051	6411230051	5262950051
17	0	3894620051	3368320051	3157800051	6420860051
	1	3684100051	3473580051	3263060051	3157800051
	2	3999880051	4526180051	4315660051	3684100051
23	0	2422850051	2010450051	2010450051	3453850051
	1	2371300051	2268200051	2268200051	2319750051
	2	2835250051	3247650051	2835250051	2422850051
34	0				
	1				
	2				
63	0	5312400050	4054200050	3075600050	5592000050
	1	4753200050	5452200050	5592000050	5871600050
	2	6850200050	7968600050	6291000050	5312400050
90	0	4350000048	6090000049	9135000049	5220000049
	1	2175000049	2175000049	3915000049	5655000049
	2	5655000049	4785000049	3915000049	



		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	40	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		7997541251				195038100
2		1516679251	111776351	1884075351	3638981752	195038101
3		1214867551	3941935050	1277220251	8988462351	195038102
4		6238446050	4906428349	6257710750	5850101452	195038103
5		7382702250	2897835750	7931062050	5457712151	195038104
		7577593750	1759155049	7579635350	3573402252	195038105

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	55	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		1615637352				195038200
2		6185590050	7217920050	9505782150	4940419252	195038201
3		3418201251	1192738351	3620321051	9617895951	195038202
4		4248373350	9793333347	4248384650	5995597752	195038203
5		1770923750	7055813348	1772128850	4557040452	195038204
		1085816551	6859275050	1284123651	6456212851	195038205

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	75	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2257017152				195038300
2		2408440050	1344052851	1765461051	1001591553	195038301
3		2155454351	2819201750	2173812851	1762741953	195038302
4		3802250351	6071731750	3850424151	1169757253	195038303
5		8440291750	2937085050	8936721550	4796767651	195038304
		1764811750	1947671051	1955650451	1903551452	195038305

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	85	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2364472652				195038400
2		1911834051	1700551750	1919382251	1749170053	195038401
3		5220430050	5631726750	2679142950	1135852453	195038402
4		5681804251	5639080050	5704724051	1181106953	195038403
5		4152353051	1266100049	4152371651	8295701652	195038404
		1427928551	1476942751	2054382451	2680647552	195038405

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	90	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2722031852				195038500
2		1587321751	1329724551	2070693351	2199535553	195038501
3		2654788551	4900711750	2699642951	9522950552	195038502
4		4633935351	2499680050	4640672451	1189707653	195038503
5		4843267851	1471971350	4845404151	8956479852	195038504
		1430059851	8724781750	1675198351	2972253552	195038505

		HARMONIC		ANALYSIS		
COEF	BLADE	LOADING	95	PER CENT	RADIUS	
STEADY		COSINE	SINE	MAX	PHI	
1		2090249852				195038600
2		1789020050	1846917851	1855562351	2644673053	195038601
3		1191237351	9970536750	1343368451	9867531452	195038602
4		7516231750	4439755050	8729556950	1098100453	195038603
5		2454567351	6263583349	2455364351	3654401950	195038604
		1819330050	1206972251	1220607051	1628561052	195038605

		HARMONIC		ANALYSIS	
RED BLADE	BEAM	BENDING	15	PER CENT	RADIUS
COFF		COSINE	SINE	MAX	PHI
STEADY		5940225054-			
1		5672852854	1344435854-	5829988654	3466671953
2		2331816754	1053606054	2558799554	1215765752
3		2027670053	1013820753	2246997653	8854909251
4		1824898254	8780063853-	2025129354	8357664452
5		2336425754	8895281554-	9197005954	5694336652
					195038210
					195038211
					195038212
					195038213
					195038214
					195038215
RED BLADE	BEAM	BENDING	28	PER CENT	RADIUS
COFF		COSINE	SINE	MAX	PHI
STEADY		5150416752-			
1		5636197553	4174337753-	7014342653	3234680253
2		5888282052	4589502053-	4627120953	1386555253
3		3532995053-	5005081753	6126409853	4173918952
4		2355132853-	5099460052-	2409904053	4805409752
5		1379528654	4293122754-	4509323954	5756280152
					195038220
					195038221
					195038222
					195038223
					195038224
					195038225
RED BLADE	BEAM	BENDING	36	PER CENT	RADIUS
COFF		COSINE	SINE	MAX	PHI
STEADY		5948750053-			
1		4818443853-	5182060753-	7076097453	2270823553
2		5240001753-	4537972753-	6931869453	1104467053
3		1637496853-	6549999353-	6751584053	3467874152
4		7204996253-	2268985753	7553824553	4062995952
5		1333343554	2560293754-	2886677854	5950189752
					195038230
					195038231
					195038232
					195038233
					195038234
					195038235
RED BLADE	BEAM	BENDING	45	PER CENT	RADIUS
COFF		COSINE	SINE	MAX	PHI
STEADY		5031000053-			
1		5373064253-	5533535253-	7712965153	2258429553
2		1048799954-	3585345053-	1108389954	9943655752
3		1779998553-	7018001353	7172019153	3369790452
4		8693996053-	2868275753	9154920653	4043538252
5		6339061753	4816464253-	7961283253	6455443352
					195038240
					195038241
					195038242
					195038243
					195038244
					195038245
		HARMONIC		ANALYSIS	
RED BLADE	BEAM	BENDING	60	PER CENT	RADIUS
COFF		COSINE	SINE	MAX	PHI
STEADY		2913560054-			
1		2276914853-	5105769253-	5590457953	2459655553
2		1905232354-	1406541353-	1910417254	9211110852
3		7620936353-	5871868253	9620681253	4746201852
4		1686597553-	3786838353	4145449953	2850185952
5		1071614754-	2821842854	3018469054	2215892652
					195038250
					195038251
					195038252
					195038253
					195038254
					195038255
RED BLADE	BEAM	BENDING	65	PER CENT	RADIUS
COFF		COSINE	SINE	MAX	PHI
STEADY		3113031754-			
1		1021388853	7125426753-	7198259653	2781574653
2		2015538354-	5275814253-	2083443554	9733424352
3		1218397154-	4147735353	1287062054	5373337352
4		3175609753-	2132776753-	3825341053	5347144452
5		1761231854-	3732609854	4127264754	2305205652
					195038260
					195038261
					195038262
					195038263
					195038264
					195038265
RED BLADE	BEAM	BENDING	80	PER CENT	RADIUS
COFF		COSINE	SINE	MAX	PHI
STEADY		3931616754-			
1		2177252753	5952584053-	6338271553	2900908053
2		2089477754-	3006626253-	2110998654	9409414952
3		2070192254-	9643753553	2283794154	5167402952
4		6079205353-	1002205353	6951825853	4292777952
5		2120758754-	4259882354	4758593854	2329323452
					195038270
					195038271
					195038272
					195038273
					195038274
					195038275
RED BLADE	BEAM	BENDING	92.5	PER CENT	RADIUS
COFF		COSINE	SINE	MAX	PHI
STEADY		1953750054-			
1		4973250052	2726480253-	2771466553	2803374253
2		6729160053-	1234087253-	6841386253	9519611352
3		9975003353-	3166668253	1046558554	5412914152
4		5462498853-	1234085353	5600166153	4181737152
5		1047232454-	1729314054	2021688154	2423962652
					195038280
					195038281
					195038282
					195038283
					195038284
					195038285

## HARMONIC ANALYSIS

WH. BLADE	BFAM	RFND	15 0/0 R	SINE	MAX	PHI	
COEF			COSINE				
STEADY			5175083354-				195038410
1			5214345054-	4234045253-	5231507054	1846422353	195038411
2			2542543354	4752315053	2586575254	5293547451	195038412
3			5487515553-	7682503353-	9441063753	7815408552	195038413
4			1737707854	8554168353-	1936844454	8344761952	195038414
5			1919403254-	8764402754	8972115954	2047055152	195038415

WH. BLADE	BFAM	RFND	2 0/0 R	SINE	MAX	PHI	
COEF			COSINE				
STEADY			1696983353				195038420
1			8806201753-	1744990753	8977426253	1687917653	195038421
2			4161535252	1681850353-	1732571653	1419490053	195038422
3			5548611752	5826097253-	5852459353	9181342852	195038423
4			3190483753-	7402662352	3199517853	4392333752	195038424
5			1505304954-	4403151054	4653351754	2177480452	195038425

## HARMONIC ANALYSIS

RED BLADE	CHORD	BENDING	15	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4289541755				195038110
1		3466097555	2481868353-	3466186455	3595897553	195038111
2		6737536753-	1944949354-	2058342054	1254466553	195038112
3		5390001754	2245825754-	5839165354	1124600753	195038113
4		3817916054-	2722934054	4689440654	3612589552	195038114
5		5015965054-	1686736255	1759738155	2131225452	195038115

RED BLADE	CHORD	BENDING	28	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4388808355				195038120
1		2979307555	6916960053	2980110355	1329978351	195038121
2		6616210053	2549730053-	5099415153	1649998553	195038122
3		2944169054	3532992854-	4598931354	1012685553	195038123
4		3680206854-	2294756054	4337029754	3701370452	195038124
5		1823480356-	1344031255	1356344655	1954525852	195038125

RED BLADE	CHORD	BENDING	60	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2130043855				195038130
1		1187879355	5319968353	1189070055	2564302551	195038131
2		2110852054	3323726753	2136859354	4474133851	195038132
3		1304892554	1995711254-	2384452954	1010595353	195038133
4		2417886054-	5982743353	2490804154	4152551552	195038134
5		2705295554	6913565554	7424015954	1372589452	195038135

RED BLADE	CHORD	BENDING	80	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1367934655				195038140
1		3920889054	2779405353	3930727954	4054750251	195038141
2		1136677854	7467808353	1360043454	1665216852	195038142
3		1097484254	8623066753-	1395723654	1072809553	195038143
4		7447200753-	6789066752	7478082153	4369779152	195038144
5		3906556753	2857728354	2884306354	1644316652	195038145

WH. BLADE	CHORD	BEND	15 O/D R			
COEF		COSINE	SINE	MAX	PHI	
STEADY		4045580055				195038430
1		3590860355-	7716842253-	3591689455	1812311153	195038431
2		7289406553-	1893822254-	2029265154	1244740353	195038432
3		3280193354-	5467001854	6175560954	4032123552	195038433
4		1093392554-	2583333348	1093392554	4499996752	195038434
5		6186808854	1781611055-	1892630755	5794440352	195038435

WH. BLADE	CHORD	BEND	28 O/D R			
COEF		COSINE	SINE	MAX	PHI	
STEADY		4139137555				195038440
1		2835823855-	1371708854-	2639149155	1827733153	195038441
2		1439692254	4156038353-	1498479354	1719489453	195038442
3		2639443854-	3359302254	4272186254	4271905052	195038443
4		2159544054-	8312141753	2113989554	3973704052	195038444
5		3643393554	1758233555-	1795585855	5634141852	195038445

## HARMONIC ANALYSIS

RED BLADE	TORSION	15 O/D R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		5765946754-				195038350
1		1645431553	2849978253-	3290869353	2999999453	195038351
2		4633341753-	2675066553	5350124953	7499997552	195038352
3		2059260853	5833333347-	2059260853	1199999553	195038353
4		5662988753-	8916933352-	5732761853	4723707952	195038354
5		3704710853-	6416729753-	7409406353	4799998852	195038355

RED BLADE	TORSION	50 O/D R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1508920054-				195038360
1		6170120052	2769281353-	2837185753	2825606753	195038361
2		6339788351-	7686841752	7712941352	4715742652	195038362
3		2536010052-	1014398553	1045618453	3467877352	195038363
4		6974013352-	1098135052-	7059940752	4723709552	195038364
5		3973830052	4965521253-	4981396853	5491510952	195038365

		HARMONIC ANALYSIS				
REF BLADE	PITCH	POSITION				
COFF		COSINE	SINE	MAX	PHI	
STEADY		1530408852				195038510
1		1658268151	1937817551	2684827151	3137995253	195038511
2		6794276749	2185431750	288609650	1263650553	195038512
3		1940983349	1940983349	2744964949	749999852	195038513
4		4853011749	1176753350	1272896550	7110290152	195038514
5		918043349	1131232750	1456877150	2581215952	195038515
REF BLADE	FLAP	POSITION				
COFF		COSINE	SINE	MAX	PHI	
STEADY		443333350				195038520
1		2145496050	2265830751	2275964851	2645910953	195038521
2		7093316849	1071507749	1729767349	1017066653	195038522
3		1950665550	1241331150	2312141650	7082372052	195038523
4		1773313749	163333346	1773313749	1319325347	195038524
5		1223941350	6520973050	6634841450	2012606952	195038525
VERTICAL	ACCEL					
COFF		COSINE	SINE	MAX	PHI	
STEADY		1043137551				195038530
1		1041219049	1464453549	1796875449	3054126353	195038531
2		1370261749	2295831749	7423393949	5031852952	195038532
3		1014883348	6089893348	6173879548	8684619452	195038533
4		1776258849	3428171749	3861017549	1565242752	195038534
5		1244202049	5801416747	1245554749	1653411152	195038535
FORE-AFT	ACCEL					
COFF		COSINE	SINE	MAX	PHI	
STEADY		4635500049				195038540
1		9646488348	7160835048	1217501149	3239735753	195038541
2		7326080349	7537164049	1051096050	6709318152	195038542
3		1652499049	7711663348	1823581849	1116610453	195038543
4		7436248549	8586641748	7485659449	4664669552	195038544
5		2320152249	7160823348	2428334449	6856985952	195038545
LATERAL	ACCEL					
COFF		COSINE	SINE	MAX	PHI	
STEADY		1634666749				195038550
1		1820722349	3751934548	1858978249	3483561453	195038551
2		7830332249	5171326049	9183854049	1672083152	195038552
3		6759998348	1126680048	6853246348	1168458653	195038553
4		9576694748	3219882749	3359282149	6335907252	195038554
5		1307233048	6005298848	6145931348	2045611452	195038555
LIFT LINK	LOAD					
COFF		COSINE	SINE	MAX	PHI	
STEADY		4948918054				195038610
1		4055685052	1280874253	1343549253	2875695753	195038611
2		4344462351	1472251853	4587142753	1706397553	195038612
3		3777851752	5000000047	3777851652	2527705547	195038613
4		1227767553	3271627352	1270628753	8626984752	195038614
5		1066675753	1357935052	1075284653	3745100752	195038615
RIGHT	CYCLIC	LOAD				
COFF		COSINE	SINE	MAX	PHI	
STEADY		1560000052				195038620
1		1549999352	7397781751	1726519552	2537110352	195038621
2		1733319751	9907330752	9908846952	4550115452	195038622
3		8333333345	1040001252	1040001252	9000001652	195038623
4		4680000052	2101554752	5130198052	6045618151	195038624
5		1560000052	1340223152	2056647752	8133287851	195038625
LEFT	CYCLIC	LOAD				
COFF		COSINE	SINE	MAX	PHI	
STEADY		1052800053				195038630
1		5639999851	1511221851	5838954451	1499989052	195038631
2		9587998552	3256263251	9593526452	9097256652	195038632
3		1127999552	1128001752	1595233752	7500002152	195038633
4		3195996752	7489389052	8142809352	7327742952	195038634
5		5639976751	2104878252	2179129552	1500001352	195038635
COLLECTIVE	LOAD					
COFF		COSINE	SINE	MAX	PHI	
STEADY		6778666752				195038640
1		2863654051	1488000652	1515305552	2591066353	195038641
2		1653334751	8590977351	8748623151	1404467053	195038642
3		1983999852	9919989751	2218178852	5114499252	195038643
4		1818665252	2004461052	2706623052	7805408152	195038644
5		2863623751	1487999952	1515304352	5617865452	195038645
STABILIZER	BAR					
COFF		COSINE	SINE	MAX	PHI	
STEADY		1705166750				195038650
1		7907119350	1887458351	2046393051	6726975552	195038651
2		3446663049	4500000043	3446663049	9000001952	195038652
3		5170021749	6893316049	8616665849	4279002852	195038653
4		1723322349	2984919549	3446677249	6000007852	195038654
5		1521166549	1124250450	1134494850	5245887952	195038655

## HARMONIC ANALYSIS

R F	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEFF			2310833349				195038310
STEADY			5324815348-	1523224948	5538399848	1640362153	195038311
1			4965833049-	9367509748	5053414649	8465865252	195038312
2			4916740047	4916700047	6953292147	1499992352	195038313
3			1966672048	5109547748-	5474968248	7276294852	195038314
4			106684248-	1031552348-	1484000248	4480729452	195038315

R A	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEFF			1252500050				195038320
STEADY			9196158348-	1732066748	9357851448	1693334953	195038321
1			2500001349-	2078461349	3251154949	7013020752	195038322
2			5499981848-	2999989748-	6264961148	6953682352	195038323
3			9000008348	3464115048	9643663348	5262945451	195038324
4			1196176848	1732042748-	2104949148	6092592052	195038325

L F	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEFF			1400000049-				195038330
STEADY			1051314449	3183012548-	1098443349	3431555253	195038331
1			5049999349	2185063749-	5494542249	1683969853	195038332
2			4999931747	5500001348-	5522681148	9173145552	195038333
3			1000007248-	1732050248	2000003148	3000004952	195038334
4			9868496747	2316990248-	2518395548	5861401352	195038335

L A	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEFF			1016666750				195038340
STEADY			8400863348	7523405248-	8771663448	3432810753	195038341
1			6125416549	1276665749	6257042349	5886554751	195038342
2			1016669048-	3333333342	1016659048	5999994052	195038343
3			8895811748	1320680048-	8993331948	8788887952	195038344
4			1284183348-	9984265047	1626647548	2842713352	195038345

RFD	PITCH LINE	POSITION	COSINE	SINE	MAX	PHI	
COEFF			2204791753-				195038370
STEADY			1223376753-	8632608052-	1497287553	2152082453	195038371
1			6266246352-	5225742752	8159303352	7008677652	195038372
2			1856665752	2320835752-	2972117852	1028865953	195038373
3			7194584752	4019811751-	7205805952	4573946852	195038374
4			6295955051	6220726852-	6252506152	5515588852	195038375

WHITE	PITCH LINE	POSITION	COSINE	SINE	MAX	PHI	
COEFF			2211300053-				195038380
STEADY			1099543853	1111288553	1563316653	4530436952	195038381
1			7289955051-	1262665752-	1447998152	1200000953	195038382
2			2915995752	2429998252	1795776952	1326853052	195038383
3			2432000051	1262662552	1285832652	1977664652	195038384
4			7894365051-	1027111253	1030140553	1807902352	195038385

IBM TAB NO. 14d

MANEUVER CONDITION NO. 38 - APPROACH AND FLARE

REVOLUTION 4

COND. 45		40		DELTA	PRESSURE
PER CENT		PER CENT		PER CENT	RADIUS
CHORD	K	(120)K	D F G	R F F S	90+(120)K
TIME	293		30+(120)K	60+(120)K	
4	0	2631750051	2842290051	2526480051	2210670051
	1	1824680051	1543960051	1438690051	1333420051
	2	1368510051	1579050051	1859770051	2315940051
17	0	1381680051	1363500051	1181700051	1054440051
	1	9453600050	8544600050	7635600050	6363000050
	2	5999400050	7090200050	9817200050	1254420051
34	0	6120000050	6840000050	6000000050	4920000050
	1	4200000050	3480000050	3240000050	3240000050
	2	3000000050	3720000050	4440000050	5760000050
63	0	2853500050	2897400050	2458400050	2107200050
	1	1756000050	1448700050	1580400050	1448700050
	2	1624300050	1668200050	2019400050	2414500050
88	0	1266900050	1143300050	8343000049	8343000049
	1	6798000049	7107000049	6798000049	6180000049
	2	6489000049	6798000049	9579000049	1081500050

COND. 55		55		DELTA	PRESSURE
PER CENT		PER CENT		PER CENT	RADIUS
CHORD	K	(120)K	D F G	R F F S	90+(120)K
TIME	293		30+(120)K	60+(120)K	
2	0	5299200051	5299200051	4239360051	3548160051
	1	2580480051	2396160051	2396160051	2626560051
	2	2580480051	2764800051	3594240051	4239360051
9	0	3090600051	3045150051	2499750051	2090700051
	1	1545300051	1363500051	1499850051	1545300051
	2	1499850051	1545300051	1999800051	2408850051
17	0	2315940051	2280850051	2000130051	1719410051
	1	1263240051	1228150051	1263240051	1333420051
	2	1193060051	1298130051	1649230051	1965040051
23	0	1778000051	1742440051	1493520051	1280160051
	1	9601200050	9245600050	9956800050	9956800050
	2	9601200050	1031740051	1355720051	1493520051
34	0	1676400051	1650000051	1465200051	1293600051
	1	1056000051	1042800051	1095600051	1082400051
	2	1056000051	1082400051	1293600051	1425600051
63	0	5413100050	5046800050	4354900050	3581600050
	1	2889700050	2889700050	3215300050	3337400050
	2	3052500050	3256000050	3825800050	4477000050
90	0	2002500050	1788900050	1628700050	1335000050
	1	1201500050	1254700050	1441800050	1308300050
	2	1201500050	1308300050	1495200050	1708800050

COND. 75		75		DELTA	PRESSURE
PER CENT		PER CENT		PER CENT	RADIUS
CHORD	K	(120)K	D F G	R F F S	90+(120)K
TIME	293		30+(120)K	60+(120)K	
2	0	7783050051	7311350051	5330210051	3726430051
	1	7264180051	7075500051	6981160051	7452860051
	2	7311350051	3962280051	5424550051	6556630051
9	0	4787810051	4491220051	3643820051	2499830051
	1	4321740051	4321740051	4279170051	4575960051
	2	4491220051	2626940051	3474340051	3898040051
17	0	2983050051	2812590051	1931880051	1335270051
	1	2698950051	2670540051	2670540051	2784180051
	2	2976230051	1477320051	1875060051	2500080051
23	0	2979650051	2824190051	2072800051	1684150051
	1	2772370051	2694640051	2616910051	2746460051
	2	2746460051	1684150051	1995070051	2487360051
34	0	1846650051	1733010051	1193220051	7670700050
	1	1704600051	1789830051	1676190051	1761420051
	2	1761420051	9943500050	1250040051	1534140051
63	0	8653500050	7499700050	5961300050	4679300050
	1	7627900050	7884300050	7499700050	8140700050
	2	8204800050	5769000050	5704900050	7243300050
90	0	4011500050	3727500050	3053000050	3124000050
	1	3834000050	3905000050	3869500050	3869500050
	2	3976000050	3301500050	3195000050	3479000050



TIME		PER CENT CHORD	R	DELTA PER CENT	PRESSURE RADIUS
		X	(120)R	H F G 30+(120)R	R F F F 60+(120)R 90+(120)R
293					
3	0		9294880051	8381990051	5560430051 9792870051
	1		9045910051	8299000051	8133020051 8381990051
	2		9294880051	1045614052	5560430051 8299000051
6	0		8622330051	7911210051	5155620051 9689010051
	1		8800110051	7822320051	7555650051 7644540051
	2		8444550051	9244560051	4888950051 7288980051
9	0		5958530051	5821680051	3903930051 7832500051
	1		6095610051	5753160051	5442220051 5205240051
	2		5753160051	6849000051	3266950051 5273730051
13	0		4213300051	3935500051	2639100051 5509700051
	1		4998500051	4074400051	3981800051 3935500051
	2		4652200051	4676300051	2639100051 3750300051
17	0		3627480051	3529460051	2254920051 4313760051
	1		4039640051	39271600051	3529440051 3529440051
	2		3725520051	39271600051	2156880051 3333360051
23	0		3179850051	2982480051	2214930051 3464960051
	1		3227710051	3048270051	2872830051 2916690051
	2		3135970051	3289500051	2171070051 2850900051
34	0		2036850051	1835000051	1302850051 2183650051
	1		2091900051	2036850051	1781800051 2018500051
	2		2181650051	2202000051	1412950051 1798300051
47.1	0				
	1				
	2				
63	0		7996800050	6949600050	4569600050 6854400050
	1		7330400050	7520800050	7140000050 7616000050
	2		8853600050	8568000050	6283200050 7044800050
77	0		3133600050	1801200050	5688000049 1896000050
	1		2275200050	2464800050	2464800050 3033600050
	2		3792000050	3792000050	1990800050 2464800050
93	0		1886000049	4715000049	1320200050 8487000049
	1		5658000049	3772000049	5658000049 9430000048
	2		4715000049	6601000049	1886000049 9430000048

TIME	PER CENT (CHORD)	F	DEFLECTA PER CENT		PRESSURE RADIUS	
			G		S	
			11201F	30+11201F	60+11201F	90+11201F
		293				
	0	0	9629620051	8571420051	5185180051	9947080051
	1	1	9523800051	9417960051	9412160051	9629620051
	2	2	1026454052	1111110052	8784060051	9412160051
	0	0	4700670051	5254690051	3318120051	7465770051
	1	1	5491050051	5161520051	5253690051	4885010051
	2	2	5254690051	6544070051	4424160051	6516330051
	0	0	4970280051	4615260051	3550200051	6982060051
	1	1	4615260051	4615260051	4378580051	4496920051
	2	2	4615260051	5088620051	4496920051	4496920051
	0	0	3382380051	3186300051	2549040051	3823560051
	1	1	3382380051	3186300051	7019240051	3088260051
	2	2	3431400051	3627480051	2941200051	2990220051
	0	0	1852000051	1666800051	1370480051	2111280051
	1	1	1852000051	1814960051	1666800051	1814960051
	2	2	1963120051	2222400051	1555680051	1740880051
	0	0	7077800050	5925600050	5411800050	6913200050
	1	1	6584000050	6254800050	5761000050	6584000050
	2	2	8230000050	9053000050	6254800050	6419400050
	0	0	8850000049-	2712500050-	1593000050-	1770000050-
	1	1	1770000050-	1150500050-	7965000049-	9735000049-
	2	2	6195000049	1327500050	8850000049-	9735000049-

TIME	PER CENT (CHORD)	F	DEFLECTA PER CENT		PRESSURE RADIUS	
			G		S	
			11201F	30+11201F	60+11201F	90+11201F
		293				
	0	0	7307400051	6730500051	7307400051	8268900051
	1	1	7884300051	7211250051	7403550051	7499700051
	2	2	8076600051	9230400051	9711150051	7403550051
	0	0	5741400051	5454330051	6219850051	7463820051
	1	1	6506920051	5741400051	5741400051	5837090051
	2	2	6315540051	6791990051	6124160051	5645710051
	0	0	4999880051	3894620051	5368260051	6841900051
	1	1	4105140051	3894620051	3684100051	3789360051
	2	2	4315660051	4420920051	4315660051	3894620051
	0	0	2577500051	2422850051	2783700051	4278650051
	1	1	2783700051	2577500051	2623050051	2577500051
	2	2	2938350051	3144550051	2886800051	2577500051
	0	0				
	1	1				
	2	2				
	0	0	5731800050	4753200050	4893000050	5731800050
	1	1	5312400050	6011400050	6291000050	6570600050
	2	2	7129800050	8248200050	7129800050	6151200050
	0	0		3480000049-	6090000049-	5655000049-
	1	1	4785000049-	1305000049	4350000049	5220000049
	2	2	3480000049	4350000049	1740000049-	1305000049

		HARMONIC		ANALYSIS	
COEF	BLADE	LOADING	40	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
		7283834251			293038100
1		2385201051	1087018251	2621219651	293038101
2		4692605550	1687535250	4985462650	293038102
3		2464916748	3232928349	3242311449	293038103
4		8963533348	7317216749	7371953349	293038104
5		1130439050	2049950049	1148875750	293038105

		HARMONIC		ANALYSIS	
COEF	BLADE	LOADING	55	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
		1388685552			293038200
1		4222961051	9870650050	4336784251	293038201
2		1343205051	9137501350	1624542851	293038202
3		3325066749	9521733349	1008560750	293038203
4		2433327250	2295613350	3345297350	293038204
5		1946020050	2677118850	3309676650	293038205

		HARMONIC		ANALYSIS	
COEF	BLADE	LOADING	70	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
		2294230852			293038300
1		1078193251	2621590050	1109607151	293038301
2		4785200751	6654330050	4831246951	293038302
3		2748466851	6144256750	2816504151	293038303
4		2230890751	3231628350	2254174651	293038304
5		2048236750	2027616749	2058248350	293038305

		HARMONIC		ANALYSIS	
COEF	BLADE	LOADING	85	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
		2564331652			293038400
1		1706791251	6710416749	1708109851	293038401
2		4794756750	2775883349	4802786350	293038402
3		4071492751	2286178350	4077816351	293038403
4		2985967751	9681483349	2987536851	293038404
5		1055925551	3843515050	1123701451	293038405

		HARMONIC		ANALYSIS	
COEF	BLADE	LOADING	90	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
		2916740652			293038500
1		1339929551	1064522251	1711320751	293038501
2		2140642851	7508126750	2268495451	293038502
3		2819971851	7035050049	2820849251	293038503
4		3233367251	6462181750	3297308951	293038504
5		6142708350	1215090851	1170673351	293038505

		HARMONIC		ANALYSIS	
COEF	BLADE	LOADING	95	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
		2305181052			293038600
1		2154158350	2135248350	3033098050	293038601
2		2812479051	1625431750	2817172151	293038602
3		2233661780	7593078350	7914801550	293038603
4		1459021551	1403315050	1166247551	293038604
5		3767326750	6274745050	7318823350	293038605

		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	15	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		4825008354-				293038210
1		4226320354	1603298153-	4229360454	3578274753	293038211
2		1622133454	1756008853	1631610454	3089191951	293038212
3		1013831353	4055341053-	4180148953	9467873352	293038213
4		7096821853	5166666747-	7096821853	8999999452	293038214
5		5386936353	4199154054-	4233566554	5546206652	293038215
RED BLADE	BEAM	BENDING	28	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		7341666751-				293038220
1		4524016553	4571954253-	6431911853	3146980553	293038221
2		8832465252	1529813853-	1766498253	1499999653	293038222
3		2355330253-	2355332253	3330941353	4499999552	293038223
4		2355334753-	5000000046-	2355334753	4500000452	293038224
5		4014056353	2751946254-	2781067154	5565975652	293038225
RED BLADE	BEAM	BENDING	36	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		5298750053-				293038230
1		3391721553-	5266669859-	6264305553	2372185453	293038231
2		4912513252-	2542610253-	2599451253	1295532953	293038232
3		4257498253-	3929999153-	5794064653	4576753652	293038233
4		4421248853-	2816221852	4430336753	4408238152	293038234
5		5684213853	1813337554-	1917520854	5744873152	293038235
RED BLADE	BEAM	BENDING	45	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1179000044				293038240
1		1074020254-	5625976754-	1212450254	2076466353	293038241
2		5589000353-	2031695353-	5946823553	9998853352	293038242
3		5519998353-	4002001253	6818093253	4801929152	293038243
4		6002996553-	8365804752	6061009353	4301658352	293038244
5		8840200353	6104022853-	7211534653	6043501652	293038245
		HARMONIC		ANALYSIS		
RED BLADE	BEAM	BENDING	60	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		1832886754-				293038250
1		1183727454-	2825014753-	1216970754	1934228153	293038251
2		1892739554-	2921277253-	1915150554	9438693752	293038252
3		5996801553-	1874000853	6282794553	5421532652	293038253
4		3685531253-	3245850052	3699796653	4374173752	293038254
5		5778327553-	1546821054	1660596854	2207260052	293038255
RED BLADE	BEAM	BENDING	65	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2340906754-				293038260
1		4404811253-	4379630253-	6211563753	2248357653	293038261
2		2417350254-	5275812853-	2474252254	9615581852	293038262
3		7128918753-	6480818352-	7158316353	6173147652	293038263
4		2397908353-	1908277753-	3064551053	5462826252	293038264
5		1024187054-	2278519254	2498121054	2284075352	293038265
RED BLADE	BEAM	BENDING	80	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		3893041754-				293038270
1		3974590052-	1254546752-	4167883552	1975178853	293038271
2		2314498554-	1781704553-	2321346254	4220098252	293038272
3		1658725554-	2443085053	1676620754	5720710952	293038273
4		2571706752	1781649353	1800163753	2044666152	293038274
5		8860536753-	3149977754	3272224254	2114214252	293038275
RED BLADE	BEAM	BENDING	92.5	PER CENT	RADIUS	
COEF		COSINE	SINE	MAX	PHI	
STEADY		2199166754-				293038280
1		1470061753	3855835052-	1519788153	3453029253	293038281
2		4670827753-	1508328553-	4908328253	9894829452	293038282
3		7758337053-	7916670052	7798623653	5805788852	293038283
4		3720833253-	1371225052-	3723359153	4552763852	293038284
5		5111728853-	1305224554	1401752054	2227742152	293038285

## HARMONIC ANALYSIS

WH. BLADE	BEAM	BFND	15 0/0 R	SINF	MAX	PHI	
COFF			COSINF				
STEADY			4754375055-				293038410
1			3368199754-	5211016053	3408271754	1712053853	293038411
2			2030376254	3168191752	2030623454	4469843850	293038412
3			3658450052-	2926671753-	2949449153	8762492352	293038413
4			1591374854	5385961753-	1680047554	8532544352	293038414
5			1267165053-	4893230354	4904125554	1876398452	293038415

WH. BLADE	BEAM	BFND	2 0/0 R	SINF	MAX	PHI	
COFF			COSINF				
STEADY			6274633353				293038420
1			1305540253-	2514865853	2833546453	1174351553	293038421
2			4161501053	2402643353-	4805287353	1650000053	293038422
3			3606630353	3051764753-	4724515853	1065878853	293038423
4			5548667752	1466666747	5548667752	3786215746	293038424
5			5630282853-	2606076754	2666202754	2043821452	293038425

		HARMONIC		ANALYSIS		
RED	BLADE	CHORD	BENDING	15	PER CENT	RADIUS
COEF		COSINE	SINE		MAX	PHI
STEADY		4648875055				293038110
1		2758286055	9026558353	2759762655	1874345551	293038111
2		2245881753-	1166971254-	1188386154	1295532053	293038112
3		4042503254	2694993054-	4858479154	1087700153	293038113
4		2021248554-	1166974754	2133939954	3749996852	293038114
5		1980349354-	1257235055	1272736355	1979029552	293038115

RED	BLADE	CHORD	BENDING	28	PER CENT	RADIUS
COEF			COSINE	SINE	MAX	PHI
STEADY			4460412555			293038120
1			2368147555	8572111753	2369698455	2073061251
2			1472128353-	7649176753-	7789548553	1295531553
3			3238586554	2355326754-	4004498354	1079909153
4			2208123254-	2294755854	3184605554	3347445152
5			1305799354-	1003621455	1012080555	1948260852

RED	BLADE	CHORD	BENDING	60	PER	CENT	RADIUS
COEFF			COSINE	SINE		MAX	PHI
STEADY			2130043855				293038130
1			9333467354	3421183353		9339735454	2099237651
2			2456264254	1329490053		2459859654	1549098651
3			1381651354	8443386753		1619218454	1095235253
4			1151373554	5717995053		1268755354	7880215252
5			1489462354	5261243854		5468014654	1483862852

RED	BLADE	CHORD	BENDING	80	PER CENT	RADIUS
COEF		COSINE	SINE	MAX		PHI
STEADY		1395371755				293038140
1		2458080854	3717091853	2486026754	8599075651	293038141
2		1215069354	3394458353	1761593054	7804207851	293038142
3		7839176753	1135650053-	8443044053	1127329153	293038143
4		6663280053-	2036690053	6967596953	4075094352	293038144
5		2856308353	2136826854	2155832554	1647727552	293038145

WH. BLADE	CHORD BFND	15 O/O R				
COFF		COSINE	SINE	MAX	PHI	
STFADY		4683396755				293038430
1		2994724055-	1327960754-	2997666955	1825390353	293038431
2		2169040754-	1156355053-	2389974854	9379451552	293038432
3		5102527054-	2551270254	5704801754	5114496352	293038433
4		4191359854-	9469160053	4296992854	4181735352	293038434
5		2247780754	1142836455-	1164731855	5627543152	293038435

WH.	BLADE	CHORD BEND	28 O/O R			
COEF			COSINE	SINE	MAX	PHI
STEADY			4523057555			293038440
1			2351448255-	1330640554-	2355210155	1832388153
2			1319732254-	2078040053	1335992454	8552586752
3			5038944054-	2399503554	5581090854	5151220152
4			2759419354-	6234120053	2828964054	4181734552
5			2405618353-	9227152554-	9230287854	5370131552

		HARMONIC		ANALYSIS		
RED BLADE	TORSION	15 O/O R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		4633350054-				293038350
1		6039857853-	5662989053-	8279452053	2231555453	293038351
2		7722242353-	4458444053	8916880053	7499998752	293038352
3		1029629553	1029678853	1456115553	1499999452	293038353
4		4633353053-	8916850052	4718374953	4227666552	293038354
5		4256486253-	5662986753-	7084284953	4661405752	293038355

RED BLADE	TORSION	50 O/O R				
COEF		COSINE	SINE	MAX	PHI	
STEADY		1411820054-				293038360
1		3464240052-	2316377553-	2342138853	2614942253	293038361
2		2536015752	2196240052-	3354824352	1595534053	293038362
3		2535988352	6319986752	6828372352	2273288052	293038363
4		5072011252-	2196226752	5527088752	1914673952	293038364
5		9282016751	2755625253-	2757188053	5438584452	293038365

		HARMONIC		ANALYSIS	
RED BLADE	PITCH	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		1566320452			
1		1853764051	2056888251-	2768976451	3120266653
2		5823303349	1666666744-	5823303349	1799999253
3		1358798350-	1164680050-	1789640350	7353373152
4		1241060049-	1666666745	1941060049	4499877152
5		2906500049-	3956938349-	4909694849	4674030252
					293038510
					293038511
					293038512
					293038513
					293038514
					293038515
RED BLADE	FLAP	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		4256000050-			
1		3237807750	1899626351-	1927022151	2796728053
2		6206674549	4607263349-	7729791949	1617066153
3		1418665750-	2127998150-	2557535850	7876997552
4		2660027549-	1075025250-	1107446050	6402549052
5		7551460049-	2504261350	2615639550	2135608052
					293038520
					293038521
					293038522
					293038523
					293038524
					293038525
VERTICAL	ACCEL	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		1035525051			
1		1031265349	1349950048-	1040063449	3525422653
2		2537363348	4834590049	4841243849	4349783652
3		6089900048-	1066666744	6089900048	5999966552
4		1471757049	1494336849	2097405849	1135904252
5		7267463348-	7440111748	1040054349	2686549252
					293038530
					293038531
					293038532
					293038533
					293038534
					293038535
FORF- AFT	ACCEL	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		1432166749-			
1		1843315549-	2498523348	1860171649	1722808953
2		4296497349-	6487685549	7781385049	6175734552
3		1652500749-	5508335048	1741888749	5385501952
4		5177832249-	3333333142	5177832249	4500000052
5		1461683749-	6314807748	1592258549	3132691152
					293038540
					293038541
					293038542
					293038543
					293038544
					293038545
LATERAL	ACCEL	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		3380000048			
1		1051194849	5633368347	1052703249	3067554951
2		6928999849	4000459749	8000919749	1500000052
3		2253331748	4506654748	5038595148	2114496852
4		1182998349	1853871849-	2199164849	7563572452
5		7547113347	5633415047	9417764347	7347775851
					293038550
					293038551
					293038552
					293038553
					293038554
					293038555
LIFT LINK	LOAD	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		4958362554			
1		3398193352	4435221752-	5587388552	3074587453
2		3069455253	1717627253-	3517356753	1653846053
3		1888850052-	1888848152-	2671236152	7499999352
4		7083408352	2453798152	7496385752	4776712451
5		1509216752-	5379748352	5587434752	2113415252
					293038610
					293038611
					293038612
					293038613
					293038614
					293038615
RIGHT	CYCLIC	LOAD			
COEF		COSINE	SINE	MAX	PHI
STEADY		1733333352			
1		1940666052	1120444452	2240888352	3000000952
2		1559998452-	1050777553	1062294453	4922226652
3		8333333345	1083333346-	1366768246	1025228653
4		2946666752	9006661551	3081240752	4249021051
5		1393339551	8044336750-	1608884251	6600006952
					293038620
					293038621
					293038622
					293038623
					293038624
					293038625
LEFT	CYCLIC	LOAD			
COEF		COSINE	SINE	MAX	PHI
STEADY		1090400053-			
1		1352876952-	5639986251	1465732052	1573693253
2		9211998252-	1628127852-	9354769452	9501147852
3		1503999852-	1166666746-	1503999852	6000001552
4		2443998752	4233133552-	4888000552	7499999852
5		6008745351	5640004351	8241035751	8637381851
					293038630
					293038631
					293038632
					293038633
					293038634
					293038635
COLLECTIVE	LOAD	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		6944000052-			
1		1068731852	6170313751	1234064652	29999995252
2		1653323851-	2863660351-	3306664551	1200000953
3		9920003351-	3306675051-	1045660452	6614499952
4		2479999252	2863649251	2496477752	1646689851
5		7673331750-	4430031750	8860316050	3000019052
					293038640
					293038641
					293038642
					293038643
					293038644
					293038645
STABILIZER	BAR	POSITION			
COEF		COSINE	SINE	MAX	PHI
STEADY		3705166750-			
1		4996011850	1963318251	2025887451	7572308352
2		2585006349	7462252049	7897307349	3544667652
3		3446691749-	5169981749	6213565449	4123011952
4		8616820048	1492432549	1723325549	1499981552
5		5186587049	5298179549	7414269449	9121958051
					293038650
					293038651
					293038652
					293038653
					293038654
					293038655

## HARMONIC ANALYSIS

R F	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY		2581250049					293038310
1		4407353348-	9174598747-	4501832548	1917590953		293038311
2		4154583049-	1234808049	4334202549	8172361252		293038312
3		4916595047-	9873300047-	1099393948	8114506852		293038313
4		7375047247	2128976548-	2253098848	7227668452		293038314
5		1000973548-	6586836746-	1003138348	3675297752		293038315

R A	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY		1350000050					293038320
1		1062916849-	2616040048	1094636449	1661732453		293038321
2		1925001249-	1948557749	2739070449	6732579052		293038322
3		3499981748-	5000116747	3535517548	5728989052		293038323
4		1125001349	7361228348	1344434749	8299488551		293038324
5		6291920047	8839801747	1085036248	1091156352		293038325

L F	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY		2050000049-					293038330
1		7714105548	5669840047	7734914048	4203660651		293038331
2		1974999749	2294967549-	4589936549	1650000053		293038332
3		4999933347	4999981747	7071007747	1500009252		293038333
4		1749993848	4763141848-	5074445648	7254337352		293038334
5		7858886747	1433009848	1634361748	1225176652		293038335

L A	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY		1095458350					293038340
1		2845690048	2795847848	3989325448	4449381452		293038341
2		5159581549	1276666049	5315181749	6948946851		293038342
3		7666666742	5083266747-	5083266747	9000029152		293038343
4		6354168348	2201160048	6724623448	4776674751		293038344
5		2043250047	2795841248	2803297548	1716403052		293038345

RED	PITCH LINK	COSINE	SINE	MAX	PHI	
COEF						
STEADY		1833458353-				293038370
1		1223376753-	8848028252-	1509810153	2158762053	293038371
2		1624581052-	1205941252	2023254252	7170658552	293038372
3		1856665552	4641650051	1913806752	4678734651	293038373
4		5337917752-	4019791751	5353032052	4392334952	293038374
5		6295958351	3220306752-	3281275152	5621245052	293038375

WHITE	PITCH LINK	COSINE	SINE	MAX	PHI	
COEF						
STEADY		1798200053-				293038380
1		1044432653	1047921653	1479519953	4509553752	293038381
2		4859969051-	8417761751	9719980051	5999993552	293038382
3		4859966751	3401997852	3436536352	2728998752	293038383
4		3888001352-	1683555752-	4236851952	5085331252	293038384
5		2182327052-	4586782852	5079481052	2308889252	293038385



IBM TAB NO. 14e  
MANEUVER CONDITION NO. 38 - APPROACH AND FLARE  
REVOLUTION 5

TIME	PER CENT CHORD	X	DELTA PER CENT		PRESSURE RADIUS	
			40		50	
			(120)K	30*(120)K	60*(120)K	90*(120)K
4	1	0	2351030051	2526480051	2456300051	2105400051
		1	1965040051	1894860051	1824680051	1543960051
		2	1438690051	1579050051	1789590051	2105400051
17	1	0	1308960051	1236240051	1108980051	1054440051
		1	1036260051	9453600050	9090000050	8362800050
		2	6908400050	7454800050	9817200050	1181700051
34	1	0	5880000050	5880000050	5400000050	5040000050
		1	4440000050	4320000050	4200000050	3840000050
		2	4720000050	4860000050	4560000050	5160000050
63	1	0	2677900050	2721800050	2414500050	2063300050
		1	1841800050	1275500050	1931600050	1668200050
		2	1756000050	1799900050	1975500050	2326700050
90	1	0	1019700050	1019700050	7579000049	7416000049
		1	8836000049	8961000049	8343000049	6489000049
		2	6489000049	7725000049	8961000049	9888000049

TIME	PER CENT CHORD	X	DELTA PER CENT		PRESSURE RADIUS	
			55		60	
			(120)K	30*(120)K	60*(120)K	90*(120)K
2	1	0	4746740051	4878400051	4285440051	3732480051
		1	3067360051	2995200051	2903040051	2718720051
		2	2764800051	3041280051	3594240051	4239360051
9	1	0	2727000051	2817900051	2545200051	2136150051
		1	1818000051	1772500051	1681650051	1590750051
		2	1545100051	1727100051	2090700051	2408850051
17	1	0	2105400051	2210670051	2000130051	1719410051
		1	1508870051	1438690051	1403600051	1333420051
		2	1368510051	1438690051	1649230051	1929950051
23	1	0	1635760051	1671320051	1457960051	1280160051
		1	1137920051	1102560051	1031240051	9956800050
		2	9956800050	1066800051	1280160051	1457960051
34	1	0	1531200051	1557600051	1465200051	1346400051
		1	1188000051	1161600051	1122000051	1082400051
		2	1108800051	1174800051	1293600051	1399200051
63	1	0	4843300050	4884000050	4354900050	3744400050
		1	3256000050	3337400050	3756000050	3174600050
		2	3256000050	3378100050	3947900050	4354900050
90	1	0	1708800050	1788900050	1575300050	1468500050
		1	1361700050	1335000050	1254900050	1201500050
		2	1201500050	1388400050	1548600050	1655400050

TIME	PER CENT CHORD	X	DELTA PER CENT		PRESSURE RADIUS	
			75		80	
			(120)K	30*(120)K	60*(120)K	90*(120)K
2	1	0	7028330051	7028330051	6179270051	4622660051
		1	4905680051	6698140051	7783050051	7311350051
		2	3726430051	4952850051	5896250051	6603800051
9	1	0	4194630051	4152260051	4109890051	3135380051
		1	3347230051	4152260051	4703070051	4575960051
		2	3220120051	3262490051	3601450051	3940410051
17	1	0	2670540051	2670540051	2244390051	1619370051
		1	1704600051	2556900051	2869410051	2755770051
		2	2272800051	1761420051	2102340051	2471670051
23	1	0	2668730051	2694640051	2357810051	1917340051
		1	1995070051	2565090051	2824190051	2668730051
		2	2176440051	1943250051	2176440051	2513270051
34	1	0	1704600051	1619370051	1392090051	1051170051
		1	1221610051	1562550051	1789810051	1676190051
		2	1420500051	1136400051	1363680051	1534140051
63	1	0	7820200050	7371500050	6538200050	5128000050
		1	6474100050	7499700050	7692000050	7692000050
		2	7884300050	6025400050	6410000050	7115100050
90	1	0	3763000050	3585500050	3337000050	3124000050
		1	4011500050	4047000050	3763000050	3727500050
		2	4260000050	3408000050	3408000050	3656500050

TIME	COND. OF		K	85 PER CENT CHORD (120)K	DELTA PER CENT D F G 30+(120)K	PRESSURE RADIUS R E F S 60+(120)K	90+(120)K
	PER CENT						
	CHORD						
			391				
2	0			8216010051	7967040051	6971160051	6390230051
	1			7718070051	8133020051	8713950051	8879930051
	2			8962920051	7967040051	7054150051	8299000051
4	0			7377870051	7288980051	6577860051	5955630051
	1			7466760051	7733430051	8177880051	7911210051
	2			8088990051	7200090051	6311190051	7377870051
9	0			5479200051	5479200051	4931280051	4725810051
	1			5616180051	5684670051	5890140051	5616180051
	2			5684670051	5136750051	4588830051	5342220051
13	0			3750300051	3657700051	3472500051	3194700051
	1			4028100051	4074400051	4305900051	4713300051
	2			4213300051	3889200051	3333600051	3750300051
17	0			3235320051	3235320051	2941200051	2941200051
	1			3627480051	3921600051	3921600051	3725520051
	2			3725520051	3431400051	2745120051	3235320051
23	0			2916690051	2894760051	2719320051	2675460051
	1			3026340051	3026340051	3092130051	3026340051
	2			3157920051	2938620051	2587740051	2872830051
34	0			1835000051	1724900051	1633150051	1669850051
	1			1963450051	2055200051	2165300051	2110250051
	2			2128600051	1981800051	1669850051	1816650051
47.7	0						
	1						
	2						
63	0			7140000050	6759200050	5997600050	5807200050
	1			7520800050	7616000050	7901600050	7901600050
	2			8853600050	8282400050	6949600050	7330400050
77	0			2180400050	1990800050	1516800050	1516800050
	1			2464800050	2844000050	3033600050	2938800050
	2			3192000050	3118000050	2464800050	2749200050
90	0			9430000048-	2829000049-	8487000049-	1225900050-
	1			5658000049-	2829000049-	9430000048-	9430000048-
	2			5658000049	1886000049	9430000048	9430000048

UNIT, IN		90		DELTA	PRESSURE	
				PER CFNT	RADIUS	
PER CFNT	K	D	F	G	R	F
CHORD		(120)K	30+(120)K	60+(120)K	90+(120)K	
TIME	191					
2	0	8042320051	7724860051	7226500051	9100520051	
	1	9523800051	9841260051	1015872051	1015872052	
	2	1026454052	1068782052	8888880051	8465600051	
9	0	4977180051	4885010051	5253690051	5898880051	
	1	5898880051	5530200051	6359730051	5806710051	
	2	5530200051	6175390051	4792840051	4977180051	
17	0	4378580051	4615260051	4851940051	5561980051	
	1	5325300051	5443640051	5325300051	5325300051	
	2	5443640051	5561980051	5088620051	4733600051	
23	0	2941200051	3088260051	3137280051	3431400051	
	1	3431400051	3382380051	3333360051	3333360051	
	2	3480420051	3529440051	3284340051	3137280051	
34	0	1592720051	1666800051	1666800051	1926080051	
	1	1926080051	1889040051	1889040051	1963120051	
	2	2037200051	1963120051	1777920051	1777920051	
53	0	5925600050	5925600050	5925600050	6748600050	
	1	6748600050	6913700050	6584000050	7077800050	
	2	8065400050	8065400050	6913200050	6419400050	
90	0	1770000050-	2389500050-	1858500050-	1416000050-	
	1	1770000050-	7965000049-	7080000049-	7965000049-	
	2		4425000049-	1239000050-	1150500050-	

		95		DELTA	PRESSURE	
				PER CFNT	RADIUS	
PER CFNT	K	D	F	G	R	F
CHORD		(120)K	30+(120)K	60+(120)K	90+(120)K	
TIME	191					
2	0	6922800051	6442050051	7499700051	8749650051	
	1	8172750051	7884300051	8076600051	8076600051	
	2	8557350051	9903450051	8365050051	7403550051	
9	0	5358640051	5454130051	5932780051	7750890051	
	1	7368130051	6219850051	6124160051	6315540051	
	2	6793990051	8420720051	6124160051	5741400051	
17	0	3789360051	3894620051	4105140051	6947160051	
	1	5473520051	4105140051	4105140051	4105140051	
	2	4315660051	4526180051	4315660051	3999880051	
23	0	2319750051	2371300051	2732150051	3402300051	
	1	2938350051	2886800051	2886800051	2886800051	
	2	3041450051	3247650051	2886800051	2577500051	
34	0					
	1					
	2					
53	0	5312400050	5032800050	5312400050	4753200050	
	1	5452200050	6430800050	6850200050	6850200050	
	2	7129800050	7409400050	7269600050	6291000050	
90	0	4350000048-	3915000049-	3915000049-	7395000049-	
	1	8265000049-	1305000049	2610000049	3045000049	
	2	1305000049	8700000048-	1740000049-		

		HARMONIC		ANALYSIS	
COEFF	BLADE	LOADING	40	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
1		7613789151	9727610850	1634058951	3653427552
2		5474038750	2273461769	5428257750	1189112451
3		9242265049	8115848369	1229988950	4623756852
4		7181567450	1869500047	2718271049	8990148552
5		1651915069	2588666767	1652117849	3617959952

		HARMONIC		ANALYSIS	
COEFF	BLADE	LOADING	55	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
1		1417508152	1122282251	506751651	1983984752
2		7330923550	5475608550	8115053950	1268287152
3		1311978750	1670056750	2044675250	4300058852
4		1662883349	149333346	1668450049	1168321251
5		856533348	1541126550	1543856950	1726213352

		HARMONIC		ANALYSIS	
COEFF	BLADE	LOADING	75	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
1		223384852	2613206750	381459950	2232427453
2		2778626750	7780073350	4150648251	5346009651
3		4117795251	1789980050	8076076853	5618791052
4		8699860050	4954716745	4644678750	4346405152
5		6618133350	3115996750	367114750	6431604952

		HARMONIC		ANALYSIS	
COEFF	BLADE	LOADING	85	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
1		2481349752	1165373051	2277810051	2166753054
2		1980362751	3183390050	1467459751	6178879551
3		1652995851	5677561750	1772755751	8835656151
4		1136600051	7690813350	4120223950	6090219452
5		1831631750	1206485050	8103439750	4376269052

		HARMONIC		ANALYSIS	
COEFF	BLADE	LOADING	90	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
1		5011174353	1034896751	3192646451	2700562552
2		2999537851	1137675050	1357519651	9240367252
3		1352743851	160563346	3169562150	8419689650
4		3186443350	1965605050	3917701650	8640666252
5		7669836750	1557831750	4035723050	6054129952

		HARMONIC		ANALYSIS	
COEFF	BLADE	LOADING	95	PER CENT	RADIUS
STEADY		COSINE	SINE	MAX	PHI
1		2365633052	4377666750	1781826351	1942273552
2		1727212751	632773350	2931949251	2622668152
3		2862966051	4127271750	5017741750	1015533952
4		9854628350	1005522750	1317440851	2180040951
5		1302106051	2102500046	2227036650	3563448252

		HARMONIC		ANALYSIS		
RED	BLADE	BEAM	BENDING	15	PER CENT	RADIUS
COFF			COSINE	SINE	MAX	PHI
STEADY			6700600054-			391038210
1			3561024354	1162269654-	3745899854	3419240353
2			1419367754	433333347-	1419367754	1800000053
3			1013839053-	5069161553	5169552053	3177000352
4			6082992353	3512028353-	1024040053	8249998252
5			1102606854	4598645553-	1194667054	6747208952

RED	BLADE	BEAM	BENDING	28	PER CENT	RADIUS
COFF			COSINE	SINE	MAX	PHI
STEADY			4342458353-			391038220
1			4358499253	5730556853-	7199708053	3072555953
2			1177665153	5099455752-	1283331453	1017066553
3			4710665753-	3827417753	6069554953	4696871052
4			1177664853-	5099455752-	1283331153	5085332552
5			7418162853	3690776553-	8285588153	6670963152

RED	BLADE	BEAM	BENDING	36	PER CENT	RADIUS
COFF			COSINE	SINE	MAX	PHI
STEADY			8405000053-			391038230
1			2944350053-	4005997753-	4971641153	2336846653
2			3766247853-	8508705052-	3861166053	9636527452
3			5567499853-	2947500553	6299588353	5070091052
4			2781747553-	2836220052	2798158653	4354567552
5			5564346853	2871503353-	6261588153	6654076452

RED	BLADE	BEAM	BENDING	45	PER CENT	RADIUS
COFF			COSINE	SINE	MAX	PHI
STEADY			4770000052-			391038240
1			7811506753-	5077603553-	9316742753	2130245153
2			3380999053-	1075603553-	1547968053	9882376752
3			4829998753-	4416000853	6544459553	4585458652
4			2276997253-	5975574252	2154100953	4132383452
5			2705504853	2926397053-	3985417953	6255078352

		HARMONIC		ANALYSIS		
RED	BLADE	BEAM	BENDING	60	PER CENT	RADIUS
COFF			COSINE	SINE	MAX	PHI
STEADY			1595513354-			391038250
1			1471852954-	5740046553-	1581683854	2012788553
2			8058196553-	1406540153-	8180029853	9495055552
3			4997333553-	4122799253	6478488653	4682579452
4			1186865853-	7573670052	1407925853	3686427452
5			5000939553-	1617242053	5255936553	3241588752

RED	BLADE	BEAM	BENDING	65	PER CENT	RADIUS
COFF			COSINE	SINE	MAX	PHI
STEADY			2185366754-			391038260
1			1374152754-	5380006753-	1475716954	2013810653
2			1261762054-	1122510052-	1263811854	9025445652
3			5573517253-	3499648853	6581157653	4929167252
4			1231357853-	2357276053	2659509753	2939524652
5			7904458053-	3824600853	8781117653	3083596352

RED	BLADE	BEAM	BENDING	80	PER CENT	RADIUS
COFF			COSINE	SINE	MAX	PHI
STEADY			1269412554-			391038270
1			6922894253-	4146776752	6935302653	1765721153
2			1909461854-	4565614353-	1963286254	9672361352
3			1092958554-	1800165353	1107684254	5688234552
4			4050375253	1002204553	4172523653	3474460151
5			9150024853-	9100479753	1290510354	2703110952

RED	BLADE	BEAM	BENDING	92.5	PER CENT	RADIUS
COFF			COSINE	SINE	MAX	PHI
STEADY			2151666754-			391038280
1			8087185052-	5924281752	1002495353	1437753053
2			7204162853-	2331052353-	7571906453	9896501852
3			4591668353-	4749288352	4616171853	5803129252
4			1029166053	6856015052	1236621253	8417610151
5			4099617053-	4157566853	5838854553	2691958152

HARMONIC ANALYSIS

WH. BLADE	BEAM	REFD	15 0/0 R				
COEF			COSINE	SINE	MAX	PHI	
STEADY							
			6931083354-				391038410
1			2690797754-	7437431553	2791692454	1645490753	391038411
2			1371875754	1584105553	1380991254	3293387851	391038412
3			8048323353	3658365353-	8840757853	1118519953	391038413
4			6402073053	2851395053-	7008351653	8399811752	391038414
5			1296786354-	4269222253	1365253654	3235553152	391038415

WH. BLADE	BEAM	REFD	2 0/0 R				
COEF			COSINE	SINE	MAX	PHI	
STEADY							
			2521283353				391038420
1			2121253-	9466143853	5077398453	1184043453	391038421
2			2774314852	1441585253-	1468038253	1404466753	391038422
3			4993759053	4161500853-	6500470553	1067314753	391038423
4			5548644752	1033333147	5448644752	2667572146	391038424
5			6740025353-	3024556353	7387549153	2116641252	391038425

		HARMONIC		ANALYSIS		
REF	BLADE	CHORD	BENDING	15	PER CENT	RADIUS
COEF			COSINE	SINE	MAX	PHI
STEADY			4985750055			391038110
1			2036826555	1183099654	2040259755	3324315851
2			1347493554	7779821753	1555954754	1500010352
3			4940837854	2245827754	5427303254	1118520453
4			6666666747	1555964754	1555964754	2249999452
5			3749090354	1961076054	4231016154	3047736352

REF	BLADE	CHORD	BENDING	28	PER CENT	RADIUS
COEF			COSINE	SINE	MAX	PHI
STEADY			4651783355			391038120
1			1891306055	1619296554	1898225455	4893610351
2			2208118754	2549716753	2222790854	3293388951
3			5299504654	1177601554	5428777954	1158237553
4			1030457354	1274866854	1639246054	3223703552
5			3014551554	1619294854	3421934554	3035142352

REF	BLADE	CHORD	BENDING	60	PER CENT	RADIUS
COEF			COSINE	SINE	MAX	PHI
STEADY			2183774655			391038130
1			7931250754	1132827254	8011743654	8128675651
2			1304888254	1988478353	1364482654	8498062551
3			7675853353	1304889354	1513909954	1001552253
4			7675827553	2659008353	8123339353	4022330952
5			1786558353	5955146753	6217359853	5066012752

REF	BLADE	CHORD	BENDING	80	PER CENT	RADIUS
COEF			COSINE	SINE	MAX	PHI
STEADY			1446326955			391038140
1			2329991054	2323625053	2341548754	5695093651
2			6663272053	3394456753	7478069953	1349778252
3			1333333348	5487401753	5487401753	9000004552
4			3527617853	6789050052	3592352953	4227659552
5			2176150052	3107515853	3115126153	5480116252

WH. BLADE	CHORD	BEND	15 0/0 R			
COEF			COSINE	SINE	MAX	PHI
STEADY			4920300055			391038430
1			2128812255	1506689254	2134137455	1840484253
2			2369039354	9469115053	2551272054	1008933753
3			6560394054	2915738354	7179157354	5201248652
4			1640092554	3156333353	1670188054	4772332852
5			2700330254	2137969854	3444226854	6432596152

WH. BLADE	CHORD	BEND	28 0/0 R			
COEF			COSINE	SINE	MAX	PHI
STEADY			4631035055			391038440
1			1687740555	1823152754	1697559155	1861653753
2			1319730854	6234076753	1459563854	1026424453
3			4079144554	2639454854	4858615254	4903155952
4			1317718754	6234123353	1459554854	3867867152
5			2240463254	5763408353	2313405354	6911478252

		HARMONIC		ANALYSIS		
REF	BLADE	TORSION	15 0/0 R			
COEF			COSINE	SINE	MAX	PHI
STEADY			4942240054			391038350
1			4357463553	6793606753	8070971453	2373236253
2			1544443753	2675066353	3088897253	5999995252
3			2059262253	2059271853	2912243353	1049999553
4			1544454753	8916850052	1783379553	3750004552
5			7907148352	1443469553	1645853653	4825732452

REF	BLADE	TORSION	50 0/0 R			
COEF			COSINE	SINE	MAX	PHI
STEADY			1426500054			391038360
1			7856725052	2053673553	2198830653	2490646953
2			7608018352	4392481752	8784977952	1499997352
3			1394798753	2535985052	1417665553	3434932351
4			7608013352	4392470052	8784967852	3750002852
5			5320695052	7359281752	9081234652	6117331852



		HARMONIC		ANALYSIS		
RFD BLADE COFF	PITCH	POSITION COSINE	SINE	MAX	PHI	
STEADY		1559526152				391038510
1		1284603851	2553602751-	2858512551	2767049453	391038511
2		3887521749-	1344880050-	1399800750	1269485853	391038512
3		1358798350-	1941366749	1372596750	5128965552	391038513
4		3882220049-	1533333345	3882220049	4499932552	391038514
5		7421500049	6891160049	1012752450	8575587751	391038515
RFD BLADE COFF	FLAP	POSITION COSINE	SINE	MAX	PHI	
STEADY		4167333350-				391038520
1		1954092251	1250325051-	2319874251	3273869753	391038521
2		6206677249	1075025050-	1241332850	2999996452	391038522
3		2817334250	1241332550-	1096993950	1171235553	391038523
4		9753296749	4607245049-	1078672850	-8367874552	391038524
5		4976685049	8991616748	5057260749	2048284151	391038525
VERTICAL COFF	ACCEL	COSINE	SINE	MAX	PHI	
STEADY		9934025050				391038530
1		8591056748	1067095249-	1366055949	3089686553	391038531
2		5075116748-	2637049349	2685441749	5044681752	391038532
3		4059891748-	7105100048	8181224748	3991462852	391038533
4		1116507349	1240631349	1661638349	1194592052	391038534
5		1559110048	1568901748-	3912932348	5869627252	391038535
FORE - AFT COFF	ACCEL	COSINE	SINE	MAX	PHI	
STEADY		1817750049				391038540
1		3816279548	1927762348	8798488748	6429468952	391038541
2		3813340048	5236871249	6158249649	5410162952	391038542
3		4059891748-	4407615348	5508333448	4228997252	391038543
4		8116641742	57264428748	5724428748	2249998052	391038544
5		3816277348	3521099348-	5192502548	6453926152	391038545
LATERAL COFF	ACCEL	COSINE	SINE	MAX	PHI	
STEADY		1380000048				391038550
1		1036099749	7282885748-	1266454449	3248961053	391038551
2		4194000249	2927165749	5279728949	1683524852	391038552
3		253333548-	5000000042-	225333548	6000004352	391038553
4		101499149	9757219848-	1407205649	1902552552	391038554
5		1347670548-	5228885047	1465554648	3175880752	391038555
LEFT LINK COFF	LOAD	COSINE	SINE	MAX	PHI	
STEADY		4854473054				391038610
1		6450708352	9030935052-	1109817253	3055378553	391038611
2		1983338053	2617336753-	3283912553	153568753	391038612
3		9445000051	4722303352	4815831052	4522986952	391038613
4		1888935052	4907553352	5258531552	1723702652	391038614
5		1728380052-	2419817052	2977725652	2510723952	391038615
RIGHT COFF	CYCLIC	LOAD COSINE	SINE	MAX	PHI	
STEADY		5200000051				391038620
1		2935550051	2507111252	2696805252	6838183752	391038621
2		2946665252-	9306886552	9762221752	5378419052	391038622
3		1466666751-	1386667552-	1429344152	8532125452	391038623
4		5200000751-	300222851-	6094444151	5250000352	391038624
5		1931127551	1406223852	1364096152	1465012952	391038625
LEFT COFF	CYCLIC	LOAD COSINE	SINE	MAX	PHI	
STEADY		8648000052-				391038630
1		2430502252-	1503998752	2858208052	1482507253	391038631
2		6015998552-	1953753752-	6325297852	9899585552	391038632
3		1128000252-	3760010051-	1189016952	6614499952	391038633
4		3007999052	3256256752-	4432974852	7818263052	391038634
5		1745012751	1503999652	1514089052	1667637252	391038635
COLLECTIVE COFF	LOAD	COSINE	SINE	MAX	PHI	
STEADY		6778666752-				391038640
1		1113032452-	8704683751-	1413403652	2180438453	391038641
2		9919992251-	2000000045-	9919992251	9000001152	391038642
3		1322666852-	3306675051-	1363373952	6467876052	391038643
4		1322665852	5727322351-	1441342152	8414668552	391038644
5		5403030351-	1443699752-	1541491552	4989633952	391038645
STABILIZER COFF	BAR	COSINE	SINE	MAX	PHI	
STEADY		3963666750-				391038650
1		2871113350-	2627707351	2643346151	9623557952	391038651
2		6893335049	5000000043	6893335049	2077941246	391038652
3		1723300049	5170030049-	5449676449	9614484052	391038653
4		3446689549	2333333344-	3446689649	8999990252	391038654
5		1137865049	6069266849	6175009049	1587629352	391038655

## HARMONIC ANALYSIS

R F	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY			2777916749				391038310
1			9012314848-	2080762248	9249399448	1669993752	391038311
2			3712083249-	3872164348	3731811549	8705297952	391038312
3			4516725047	1966662748-	2027191248	9467881352	391038313
4			4179161348-	2128982348	4690197848	3825110852	391038314
5			4754342848-	3775766047	4769312248	3509185252	391038315

R A	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY			1482500050				391038320
1			2732051748-	1669616749	1691821849	9929315152	391038321
2			1450001049-	3290896749	3596179149	5688938152	391038322
3			3999985048-	8499988348-	9394130148	8159964152	391038323
4			5500014748	3464113348	6500018748	8051061551	391038324
5			7320853347	6303855048	6146222348	1667515052	391038325

L F	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY			2975000049-				391038330
1			7763141748	9580130048-	1233066349	3090191653	391038331
2			3024999849	2121762349-	1694928849	1624769253	391038332
3			1499995048	2166666742-	1499995048	1199997953	391038333
4			2749991848	3897116248-	4769692748	7610216052	391038334
5			1763152348-	9198764047-	1988687748	4151041452	391038335

L A	PYLON	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY			1125958350				391038340
1			8419111748	4624869348	9605772148	2878130652	391038341
2			4727498249	8804586748	4808788449	5275004551	391038342
3			1525007748	2033341748	2541678048	1771002452	391038343
4			7116670048	5804483347-	7170926148	8823685352	391038344
5			2255908348	1983482848	3003885248	8264640151	391038345

RED	PITCH LINK	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY			1926291753-				391038370
1			8706993252-	8027405752-	1184276053	2226744953	391038371
2			1856664352-	2411881752	3043743752	6379452552	391038372
3			5569998852	4641686751-	5589305952	1184121153	391038373
4			2320834752-	3215840252	3965841952	3145438952	391038374
5			1744489852	7917628351-	1915759152	6711767552	391038375

WHITE	PITCH LINK	POSITION	COSINE	SINE	MAX	PHI	
COEF							
STEADY			1895400053-				391038380
1			6573773352	1028388153	1220543853	5741203352	391038381
2			7290026751	4208888351-	8417792551	1650000353	391038382
3			2430003352-	4859978351	2478126352	5623004652	391038383
4			7290005051-	1262662752	1457998252	3000001852	391038384
5			2685774552-	1866116052	3270439652	2904157252	391038385

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